
THE SIR JOSEPH BANKS ISLANDS.

REPORTS OF THE EXPEDITION OF THE McCOY
SOCIETY FOR FIELD INVESTIGATION
AND RESEARCH.

PART ONE.

Contents.

1. General Introduction.—D. J. MAHONY
2. List of Vascular Plants.—Miss S. G. M. FAWCETT and Miss C. E. VANCE
3. Hydrozoa.—M. BLACKBURN
4. Echinodermata.—L. W. STACH
5. Mollusca, Part 1: The Spermatophore of *Rossia australis* Berry—B. COTTON
6. Sipunculoidea.—Miss M. B. WHEELER
7. Ixodoidea.—J. A. Tubb
8. Decapoda.—Miss B. H. ANDERSON
9. Isoptera.—G. F. HILL
10. Hymenoptera (Formicidae).—J. CLARK
11. Reptilia, Part 1: General.—J. A. TUBB
12. Reptilia, Part 2: The Venom of *Notechis scutatus* variety *niger* (Reevesby Island).—Dr. F. G. MORGAN
13. Aves.—Professor F. WOOD JONES, H. CONDON, G. MACK, J. F. RUTTER, and J. A. TUBB

1. General Introduction.

By D. J. MAHONY, M.Sc.

The Sir Joseph Banks Group consists of about 20 islands, islets and reefs lying eastward of Louth Bay in Spencer Gulf, South Australia.

Matthew Flinders discovered the group in 1802 during his survey of the southern coast of Australia in the sloop *Investigator*, 334 tons. Under the date Feb. 26, 1802, he records that "Three small isles had been seen from Thistle's Isle and their bearings set; and the discovery of them now augmented by several others, forming a cluster to the eastward of Point Bolingbroke. This was called the Sir Joseph Banks group, in compliment to the Right Honourable president of the Royal Society, to whose exertion and favour the voyage was so indebted"(1). The view to which Flinders refers was obtained from Stamford Hill, Port Lincoln, which he had named in honour of his native county. He named the various islands after Lincolnshire villages, near one of which Sir Joseph Banks lived in Reevesby Abbey.

On Saturday, March 6, Flinders landed on Kirkby Island to take bearings of the other members of the group, but they proved so numerous that his observations were not completed before dark. Next morning he landed with 'the botanical gentlemen', one of whom was the famous Robert Brown. He noted that granite forms the basis of Kirkby Island and that it is covered with a stratum of calcareous rock. "The island was destitute of wood, and almost of shrubs; and although there were marks of its having been frequented by geese, none of the birds were seen, nor any other species of animal except a few hair seals upon the shore. This description, unfavourable as it is, seemed applicable to all the group, with the exception of Reevesby and Spilsby Islands, which are higher and of greater extent, and probably somewhat more productive"(2).

For a number of years the islands have been leased for grazing sheep, but the carrying capacity is low and the effects of human occupation are not very marked.

The McCoy Society visited the islands in December, 1936, and spent about two months in investigating the geology, botany, and zoology of the group. The following papers are the first part of a series describing the results. The remainder will appear in vol. 51 (1) of the Proceedings of the Royal Society of Victoria.

1. Flinders, Matthew. A voyage to Terra Australia. Vol. 1, p. 142.

2. *Ibid.*, p. 153.

Most of the islands rise less than 100 ft. above sea level, the highest land being near the northern end of Spilsby Island which is marked 162 ft. on the Admiralty chart. The northern part of the group, except Dalby and Kirkby Islands, all rise from a shoal about nine miles long, as defined by the 5-fathom line; the more southern islands are separated by deeper water. All consist of a complex of ancient igneous and sedimentary rocks overlain in part by consolidated dune limestone, probably of post-tertiary age, and recent unconsolidated sand dunes.

The annual rainfall is about 15 inches, and summer daytime temperatures are high, but during our visit the nights were cool and there was a considerable precipitation of dew. There is no permanent surface water, but two wells on Reevesby Island sunk in the superficial deposits yield a supply of rather brackish hard water.

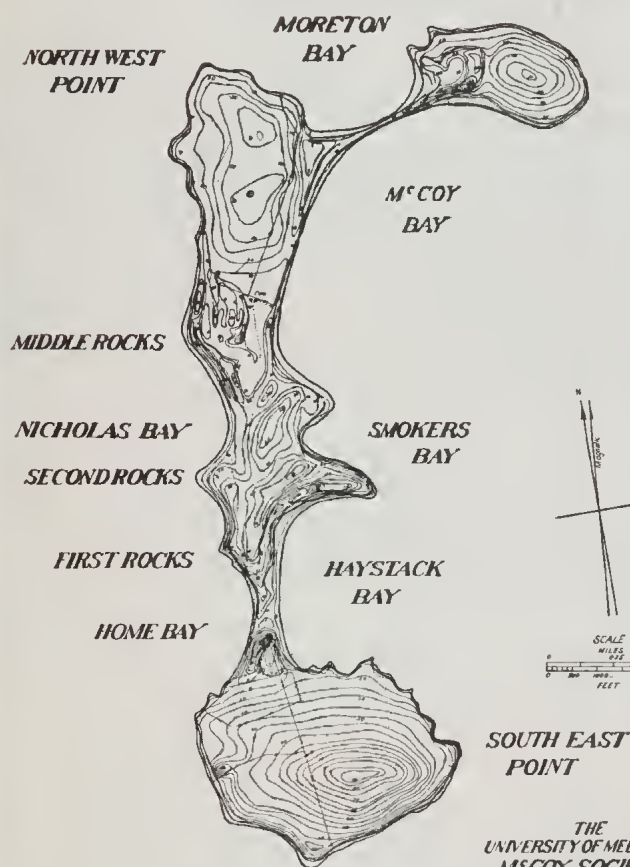
The larger islands are covered for the most part with a fairly thick growth of Boobyalla bushes and there are a very small number of Eucalypts and Casuarinas. The more open parts of the islands support a thin covering of grass, and *Mesembryanthemum* flourishes on the sand hills.

The only surviving mammals are seals on some of the smaller islets, but bones of *Arctocephalus cinereus* and *A. doriferus* are abundant in places on Reevesby Island. Wallabies of the *eugenii* type must once have been plentiful if one may judge by the bones among the sand hills, but none survive. A mandible of the peculiar Australian Rat, *Conilurus*, was found, but no living specimens were seen.

Birds of especial interest are the Rock Parrot, *Neophema petrophila*, and the White-faced Storm Petrel, *Pelagodroma marina*, which breeds in large numbers on Reevesby Island. Several other sea birds nest on various islands, including large colonies of Crested Terns, *Sterna bergii*, and two species of Cormorants, *Phalacrocorax fuscescens* and *P. varius*. Few species of Passerine birds were noted, the most common being the Silvereye, *Xosterops lateralis*.

Tiger snakes, usually almost black, are very plentiful and according to reliable accounts Death Adders were formerly only too common, but none was seen during our visit. The commonest lizards are the Stumpy-tail, *Trachysurus rugosus*, and small skinks; there are also a few Lace Lizards (*Varanus sp.*).

Insects are fairly abundant and diversified. The most interesting are the Ants which are represented by great numbers of individuals; 33 species were collected, of which 14 are new.



THE
UNIVERSITY OF MELBOURNE
M'COY SOCIETY
MAP OF
REEVESBY ISLAND
Sir Joseph Banks Group SA.

CEPARRIS 78.37

2. List of Vascular Plants.

By STELLA G. M. FAWCETT, M.Sc., and C. ELIZABETH
VANCE, M.Sc.

The first list of plants of the Sir Joseph Banks Group of Islands was made by J. H. Maiden in 1908. He visited Reevesby Island in 1907 and remained for one day. His records are necessarily incomplete, as he visited the island in the dry season. He gives a list of sixteen species. The following list also gives an incomplete picture of the vegetation of the group, as our collections were made in the driest months of the year, when annuals are lacking. Many of these have been identified by their fruits and seeds, but it was found impossible to name others as only their fragmentary remains were present.

References.

- MAIDEN, J. H., 1908.—*Trans. Roy. Soc. South Aust.*, xxxii., pp. 252-286.
BLACK, J. M., 1922-29.—*Flora of South Australia*.

Family.	Species.	Reesby.	Winchby.	Lusby.	Ualby.	Marum.	Kirkby.	Langton.	Silsey.	L. English.	Roxby.	Hareby.	Blyth.	Spilsby.	L. Spilsby.	Partney.	Habitat.	Habit.
Potamogetonaceae ..	<i>Zostera tasmanica</i> G. V. Martens	+	..	+	+	+	+	+	..	..	+	..	..	..	+	..	Above and just below low tide mark	
	<i>Cymodocea antarctica</i> (Labill.) Endl.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Submerged	
	* <i>Posidonium australis</i> Hook. f. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Submerged	
Hydrocharitaceae ..	<i>Halophila ovalis</i> (R. Br.) Hook. f.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Submerged	
	* <i>Spinifex hirsutus</i> (R. Br.) Benth.	+	..	+	+	..	+	+	+	..	+	..	+	+	+	+	Outer edges of sand-dunes	Stout creeping grass
	<i>Stipa elegantissima</i> Labill.	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	Travertine and sandy soil	Tufted grass
Gramineae	<i>S. crumpeana</i> Reader ..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	Dunes and travertine cliffs	Small tussocky grass
	<i>S. arctifolia</i> Steud. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Travertine ..	Tussocks '6 m.
	<i>S. horridifolia</i> J. M. Black ..	+	..	..	..	..	+	..	..	..	..	..	..	..	..	..	Travertine ..	Minute tussocks, leaves 3 cm. long
	<i>S. scabra</i> Lindl.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Sandy soil ..	Tussocks
	<i>Sporobolus virginicus</i> (L.) Kunth.	+	..	+	+	..	+	+	..	..	+	..	..	..	..	..	Outer sides of dunes ..	Dwarf creeping grass
	<i>Cadagrostis filiformis</i> (Forst.) Pilger	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Sandy soil ..	Small grass to 5 cm. high
	+ <i>Amnophila arenaria</i> (L.) Link.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Dunes ..	Tufted grass to '6 m. high
	<i>Danthonia semianulata</i> (Labill.) R. Br.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Travertine ..	Minute tussocks 2-4 cm. high
	+ <i>Koeleria philloides</i> Pers.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Travertine and sandy soil	Erect annual 10 cm.
	* <i>Distichlis spirata</i> (L.) Greene	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Dunes, travertine and granite slopes as on Kirkby	Creeping grass 5 cm.
	<i>Poa caespitosa</i> Forst. ..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Dunes ..	Tussocks 30 cm.
	+ <i>Festuca brumides</i> L. ..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Travertine and sandy soil	Small annual 10 cm.
	+ <i>Bromus madritensis</i> L.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Sandy soil ..	Annual to 15 cm.
	<i>B. arvensis</i> Labill.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Travertine and sandy soil	Erect annual to 12 cm.
	+ <i>B. unioloides</i> H. B. et K.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Sandy soil ..	Minute annual 5 cm.
	+ <i>B. uniolis</i> L. ..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Sandy soil ..	Erect annual 20 cm.
	<i>B. serotus</i> L.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Sandy soil ..	Erect annual 10 cm.
	<i>Cynodon dactylon</i> Rich.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Travertine ..	Prostrate perennial grass 6 cm.
	+ <i>Lolium temulentum</i> L.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Sandy soil ..	Erect grass 12 cm.

* = Recorded by Maiden. † = Introduced.

Family.	Species.	Reevsby.	Winceby.	Lusby.	Dalby.	Marum.	Kirkby.	Langton.	Stoey.	L. English.	Koxy.	Hareby.	Blyth.	Spilsby.	L. Spilsby.	Partney.	Habitat.	Habit.
Gramineae—continued	† <i>L. perenne</i> L.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Sandy soil	Prostrate tufted grass
	† <i>L. rigidum</i> Gaudin	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Dunes	Small annual grass, rigid, 10 cm.
	<i>Lepurus incurvatus</i> Trin.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Sandy soil	Prostrate tufted grass
	<i>L. cylindricus</i> Trin.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Dunes	Rigid, erect grass 8 cm.
	*† <i>Hordeum murinum</i> L.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Sandy soil	Small herb 8 cm.
	† <i>H. maritimum</i> With.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Dunes	Small herb 5 cm.
Cyperaceae	*† <i>Scirpus nodosus</i> Rothb.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Dunes	Tussocks
Juncaceae	<i>Juncus bufonius</i> L.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Travertine and sand	Small herb, 15 cm.
Liliaceae ..	<i>Dianella revoluta</i> R. Br.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Dunes	Tussocks 10-70 cm.
	<i>Bulbine semibarbata</i> (R. Br.) Haw.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Travertine	Dwarf herb
Casuarinaceae	*† <i>Casuarina stricta</i> Ait. (1759)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Granite and deep sandy soil	Tree 7 m.
Urticaceae	† <i>Urtica urens</i> L.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Travertine	Erect annual, 10 cm.
Santalaceae	<i>Exocarpus aphylla</i> R. Br.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Dunes	Stiff leafless shrub, 70 cm.
Polygonaceae	*† <i>Muehlenbeckia adpressa</i> (Labill.) Meisn.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Sandy soil	Perennial climber, sometimes trailing
Chenopodiaceae	<i>Chenopodium baccata</i> (Labill.) Moq.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Travertine and sandy soil	Erect or scrambling shrub, 5 m.
	<i>R. parabolica</i> R. Br.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Sandy soil	Erect shrub, 7 m.
	<i>R. crassifolia</i> R. Br.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Sandy soil, travertine	Erect or straggling shrub, 1 m.
	<i>R. nutans</i> R. Br.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Sandy soil, travertine	Weak trailing herb
	*† <i>Chenopodium carinatum</i> R. Br.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Sandy soil	Minute herb
	† <i>C. murale</i> L.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Sandy soil	Stout annual, 3 m.
	*† <i>Atriplex patula</i> R. Br.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Travertine, sandy soil, salt pans	Erect or straggling shrub to 5 m., often forming circular patches, 4 m. diameter

* = Recorded by Malden. † = Introduced.

Family.	Species.	Reesby.	Wineby.	Lusby.	Dalby.	Marum.	Kirkby.	Langton.	Sibsey.	L. English.	Roxby.	Hareby.	Blyth.	Spilsby.	L. Spilsby.	Partney.	Habitat.	Habit.
Chenopodiaceae— <i>en- tailed</i>	* <i>Atriplex cinereum</i> Poir.	..	+	+	+	+	+	+	+	..	..	..	..	+	+	..	Extreme outer edge of dunes	Erect shrub, 1' 7 m.
	<i>A. Muelleri</i> Benth.	..	+	..	..	..	+	+	+	..	..	..	..	+	+	..	Edge of travertine pla- teaux	Small shrub, 100 cm.
	<i>Bassia ventricosa</i> J. M. Black	..	+	+	+	+	+	+	+	..	..	..	..	+	+	..	Travertine ..	Diffuse, weak shrub, 15 m.
	<i>B. biflora</i> (R. Br.), F. v. M.	..	+	+	+	+	+	+	+	..	..	..	..	+	+	..	Travertine ..	Diffuse, weak shrub, 5 m.
	<i>Kochia oppositifolia</i> F. v. M.	..	+	+	+	+	+	+	+	+	+	+	+	+	+	..	Salt pans, travertine ..	Erect succulent shrub, 5 m.
	<i>Salsola Kali</i> , L.	..	+	+	+	+	+	+	+	..	+	+	+	+	+	..	Travertine, sandy soil ..	Bushy or straggling herb, 50 cm.
	<i>Suaeda australis</i> (R. Br.) Moq.	..	+	+	+	+	+	+	+	..	+	+	+	+	+	..	Near sea at foot of cliff's	Succulent herb, 20 cm.
	* <i>Enchylaea tenacetosa</i> R. Br.	..	+	+	+	+	+	+	+	..	+	+	+	+	+	..	Sandy soil, travertine ..	Semi-prostrate or scran- bling shrub, leaves succulent
	<i>Threlkeldia diffusa</i> R. Br.	..	+	+	+	+	+	+	+	..	+	+	+	+	+	..	Sandy soil, travertine ..	Semi-prostrate or scran- bling shrub, leaves succulent
	<i>Arthrocnemum halocnemoides</i> , Nees, var <i>pergranulatum</i> J. M. Black	..	+	+	+	+	+	+	+	..	+	+	+	+	+	..	Salt pans ..	Erect, or spreading suc- culent shrub, 5 m.
Aizoaceae	<i>Salsola australis</i> Banks et Sol.	..	+	+	+	+	+	+	+	..	+	+	+	+	+	..	Salt pans ..	Prostrate, half shrub, 3 m.
	* <i>Halimolobos lateralis</i> L.	..	+	+	+	+	+	+	+	..	+	+	+	+	+	..	Travertine, sandy soil ..	Succulent, creeping herb 15 cm.
	<i>M. acutilateralis</i> Haw.	..	+	+	+	+	+	+	+	..	+	+	+	+	+	..	Travertine dunes, sandy soil	Succulent, mat plant
	<i>M. australe</i> , Soland	..	+	+	+	+	+	+	+	..	+	+	+	+	+	..	Travertine, dunes ..	Succulent mat plant, often scrambling
	<i>Tetragonia implexicoma</i> (Miq.) Hook. f.	..	+	+	+	+	+	+	+	..	+	+	+	+	+	..	Travertine, cliffs, sandy soil	Scrambling weak half shrub
Caryophyllaceae	<i>Spergularia rubra</i>	..	+	+	+	+	+	+	+	..	+	+	+	+	+	..	Travertine ..	Small herb, 5 cm.
	* <i>Silene gallica</i> L.	..	+	+	+	+	+	+	+	..	+	+	+	+	+	..	Travertine ..	Small herb, 10 cm.
	<i>Scleranthus pungens</i> R. Br.	..	+	+	+	+	+	+	+	..	+	+	+	+	+	..	Travertine plateau near sea	Cushion bush, 80 cm.
Ranunculaceae	<i>Polycarpon tetraphyllum</i> Loeft.	..	+	+	+	+	+	+	+	..	+	+	+	+	+	..	General ex. on dunes ..	Prostrate annual
	<i>Clematis micrantha</i> D. C.	..	+	+	+	+	+	+	+	..	+	+	+	+	+	..	Dunes ..	Half woody climber

* = Recorded by Maiden. † = Introduced.

Family.	Species.	Reevsby.	Wineby.	Luaby.	Dalby.	Marum.	Kirkby.	Langton.	Sibsey.	L. English.	Hoxby.	Hareby.	Blyth.	Spilsby.	L. Spilsby.	Partney.	Habitat.	Habit.
Papaveraceae	<i>Papaver aculeatum</i> Thunb., 1813	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Small herb, 10 cm.	
Cruciferae	† <i>Sisymbrium orientale</i> L., 1759	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Robust herb, 100 cm., annual	
	<i>Lepidium foliosum</i> Desv.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Erect herb, 100 cm.	
	† <i>Coronopus didymus</i> (L.), Sm.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Small, straggling herb, 5 cm.	
Crassulaceae	† <i>Cakile maritima</i> Scop.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Procumbent herb, 10 cm.	
	<i>Crassula Sieberiana</i> (Schultes), Oestf.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Minute annual	
Piptosporaceae	<i>Bursaria spinosa</i> Cav.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Erect bushy shrub, 2 m.	
Leguminosae	<i>Acacia calamifolia</i> Swed.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Erect shrub, 2 m.	
	<i>A. rupicola</i> F. v. M.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Dense rounded shrub, 1.5 m.	
	<i>A. Osculatii</i> F. v. M.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Shrub or small tree, 5 m.	
	<i>Pultanea daphnoides</i> Wendl.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Shrub, 1 m.	
	† <i>Medicago dentatula</i> Willd.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Small, straggling herb, 6 cm.	
Geraniaceae	**† <i>Erodium cicutarium</i> (L.), L'Her.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Minute annual, 2 cm.	
	<i>Pelargonium australe</i> Willd.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Dense herb, to 100 cm.	
Oxalidaceae	<i>Oxalis corniculata</i> L.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Minute herb, 4 cm.	
Zygophyllaceae	*† <i>Nitaria Schobertii</i> L.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Fleshy-leaved shrub, 3 m.	
Sapindaceae	<i>Dodonaea viscosa</i> L.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Erect shrub, 1 m.	
	<i>D. attenuata</i> A. Cunn.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Erect shrub, 1 m.	
Malvaceae	*† <i>Lavatera plebeja</i> Sims.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Herb or half-shrub, erect, to 1.5 m.	
	*† <i>Malva parviflora</i> L.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Erect spreading annual	
Frankeniaceae	*† <i>Frankenia pauciflora</i> D. C.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Semi-prostrate dwarf shrub	
Thymelaeaceae	<i>Pinula serpyllifolia</i> R. Br.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Shrub, 1 m. high	
Myrtaceae	<i>Meinertia halmaturorum</i> F. v. M.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Tree to 4 m., dense canopy	
	<i>Eucalyptus angulosa</i> Schau.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Tree, 5 m., mallice	
Umbelliferae	<i>Daucus albidithus</i> (Labiil.), Fisch., Mey. et Avo-Lall.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Herb, erect, 15 cm.	
	<i>Apium australe</i> Pet-Thou.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Herb, 15 cm.	

* = Recorded by Maiden. † = Introduced.

Family.	Species.	Reevsy.	Wineby.	Lusby.	Dalby.	Marum.	Kirkby.	Langton.	Sibsey.	L. English.	Roxby.	Hareby.	Blyth.	Spilsby.	L. Spilsby.	Partney.	Habitat.	Habit.
Gentianaceae	<i>Erythraea spicata</i> Pers.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Travertine ..	Erect herb, 10 cm.
Convolvulaceae	<i>Convolvulus erulescens</i> Sims.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Travertine ..	Slender twining herb
Solanaceae	<i>Dichondra repens</i> Forst. et F.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Damp places, sandy soil	Herb, creeping, 5 cm. high
	<i>Solanum nigrum</i> L.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Sandy soil and travertine	Diffuse half-shrub
	<i>Lycium australe</i> F. v. M.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Travertine, some on sandy soil	Shrub, intricate branches, 60 cm.
	† <i>L. ferocissimum</i> Miets.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Sandy soil, edges of travertine plateaux	Spiny shrub, 1.6 cm.
	† <i>Datura stramonium</i> L.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Sandy soil	Stout herb, 15 cm.
Myoporaceae	* <i>Myoporum insulare</i> R. Br.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Dunes and sandy soil	Rosette plant, 30 cm.
Campanulaceae	<i>Wahlenbergia gracilis</i> (Forst. f.) A. DC.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Sandy soil and deep travertine soil	Spreading shrub, to 6 m.
Compositae	<i>Brachycome pachyptera</i> Turcz.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Dunes ..	Slender herb, to 20 cm.
	<i>B. exilis</i> Sand.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Travertine ..	Small herb, 10 cm.
	<i>Cotula coronopifolia</i> L.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Travertine ..	Slender herb, 9 cm.
	* <i>Senecio jacobae</i> Sol.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Swampy depressions	Small erect herb, 15 cm.
	† <i>Cryptanthemum calandulaceum</i> (L.) R. Br.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Sandy soil ..	Free branching herb
	<i>Cassinia spectabilis</i> (Labill.) R. Br.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Sandy soil, travertine ..	Straggling herb, 7 cm.
	† <i>Poa-sperma angustifolium</i> Labill.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Half-shrub, to 1 m., leaves sticky, woolly beneath	
	† <i>Luula graveolens</i> (L.) Desf.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Herb, erect, 10 cm.	
	* <i>Calceophalus Brodiaei</i> (Cass.) F. v. M.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	All habitats ex. dunes ..	Robust herb, to 75 cm.
	† <i>Centaurea multensis</i> L.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Dunes ..	Divaricate shrub, white tomentum, forming dense mounds to 2 m. diameter
	† <i>Senecio oleraceus</i> L.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Sandy soil, travertine ..	Erect herb, to 15 cm.
	<i>S. asper</i> Hill.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	All habitats ex. dunes ..	Erect herb, to 20 cm.
	<i>Helichrysum leucosidum</i> D. C.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Among rocks near sea ..	Erect herb, to 10 cm.
	<i>Gnaphalium luteo album</i> L.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Travertine ..	Erect herb, 15 cm.
	<i>Olearia erillaris</i> (DC.) F. v. M.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Travertine ..	Erect herb 25 cm.
	<i>O. ramulosa</i> (Labill.) Benth.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Dunes, sandy soil ..	Erect bushy shrub, 1-3 m.
		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Deep sandy soil ..	Dense shrub, 1.5 m.

* = Recorded by Maiden. † = Introduced.

3. Hydrozoa.

By MAURICE BLACKBURN, M.Sc.

In the following report, 35 species of Hydrozoa are listed, representing specimens collected during the months of December 1936 and January 1937. Of these species, all of which belong to the order Calyptoblastea (Leptomedusae), 34 are polyp-types and 1 a medusa-type. Apart from descriptions of new species, the only details given are those relating to locality, presence or absence of gonosomes, additions or corrections to previous descriptions and important varietal differences. Only the most significant references to synonymy are given.

Types of new species are located in the National Museum Collection, Melbourne.

It should be stated that family and generic divisions have been used here in the senses in which they have generally been understood by Australian workers in this field. There are however two notable amendments: the genus *Parascyphus* Ritchie, 1911, regarded by many authors as synonymous with *Thyroscyphus* Allman, 1877, is regarded following Stechow (Zool. Jahrb., Syst., xlvii., 1923a, p. 170) and Spletstösser (*ibid.*, lviii., 1929, pp. 100-104 *et seq.*) once more as a separate genus; and the genus *Dynamena* Lamouroux, 1812 is also recognised as defined by Billard (Rep. Sci. Siboga-Exped., Mono. viib., 1925, p. 21), whose divisions of the Sertulariidae appear to the author to be founded on the most comprehensive range of significant characters. Regarding family divisions, the correct systematic positions of the genera *Parascyphus* and *Stercotheca* are notably still somewhat dubious: the author has therefore judged it best to include them in the families to which Australian scientific opinion has most recently referred them, i.e., the Campanulinidae and Syntheciidae respectively.

Two other debatable points come within the scope of this report, in connexion with the genera *Paracalix* Stechow, 1923 (Campanulariidae) and *Phylactotheca* Stechow, 1913 (Haleciidae). The first of these was proposed by Stechow (Zool. Anz., lvi., 1923b, p. 3, and *loc. cit.*, 1923a, p. 106) for the reception of two species of *Campanularia* (*C. ambiplica* Mulder and Trebilcock and *C. pulcrathea* M. and T.), the basis for this separation being given as the bilateral symmetry of the hydrothecae and the inflection of the hydrotheca-walls to form one or two more or less prominent intrathecal ridges. Regarding the first point it should be noticed that at least one species specifically retained by Stechow himself in the genus *Campanularia* (*C. australis* Stechow) exhibits the same character in cross-section, and there are possibly others also with the same type of symmetry: regarding the second, it appears to the author that the development of the intrathecal ridge in these two species is to be regarded

as closely parallel with that occurring in certain species of the Plumulariid genus *Kirchenpaueria* (*K. mirabilis* Allman, *K. producta* Bale, *K. allmani* Torrey, and *K. biseptata* sp. nov.) but not in other members of the same genus (*K. pinnata* Linnaeus, *K. similis* Hincks and *K. hians* Marktanner-Turner-etscher). Stechow, it is true, does propose (Zool. Jahrb., Syst., xlii., 1919, p. 110) for these former species the separate genus *Pycnotheca* (*Diplocheilus* Allman, 1888 praeocc.) but he bases the distinction on other characters in addition to the intrathecal ridge: while Bale (Commonwealth Fisheries, Zoo. Res., ii., i., 1914, p. 61, and *ibid.*, iii., v., 1915, p. 302) in defending the retention of the same forms in the genus *Kirchenpaueria*, points out that the presence of such a ridge in the Plumulariidae or Sertulariidae has never been regarded of generic importance. It therefore seems to the author desirable that the genus *Paracalis* be suppressed and that the species referred to it be replaced in the genus *Campanularia* until such time as the possible discovery of a wholly distinct type of gonosome shall preclude this proceeding.

The second genus *Phylactotheca*, comprising two recorded species *P. pacifica* Stechow from Tonga and *P. armata* Stechow from Australia, commands a somewhat better case for recognition. Stechow (*loc. cit.*, 1923a, pp. 86-87) recognises four genera of nematophore-bearing Haleciidae, three of which he places in the subfamily Haleciinae ("Theken napfförmig, mit einer Punktreihe am Rande") and one in the subfamily Phylactothecinae ("Theken tief-glockenförmig, völlig frei"). The first three are separated by him on the basis of supposed differences in the nematophores, viz., *Hydrodendron* Hincks, 1874 ("Nematophoren klein, ohne Nematotheken"), *Diplocyathus* Allman, 1888 ("Nematophoren klein, mit rohrenförmiger Nematothek an der Basis jeder Theka") and *Ophioidissa* Stechow, 1919 (*Ophiodes* Hincks 1868 praeocc.—"Nematophoren sehr gross, mit becherförmiger Nematothek"), while to the diagnosis of *Phylactotheca* is added: "Nematotheken einkammerig, nicht beweglich, glockenförmig". It is the opinion of this author that these divisions based on the character of the nematophores are purely artificial, and that the first three genera at least should therefore be combined under a single head; while if the genus *Phylactotheca* is to be held valid it must be on the basis of characters other than the nematophores. Regarding first, the genus *Hydrodendron*, one must assume that Stechow has overlooked the account by Bonnevie (Bergens Mus. Aarbog., 1898, p. 11) of "*Halecium*" *gorgonoide* Sars, for the accommodation of which Hincks erected the genus. Bonnevie describes and figures the nematophore-cups, or sarcothecae, of this species, which were apparently overlooked by Sars; the genus then cannot be retained, and the Norwegian author does

in fact refer Hincks' genotype to *Ophiodes*. Regarding next *Diplocyathus*, Billard (Ann. Sci. Nat., Zool., (9), xi., 1910, p. 4) and Jäderholm (Kungl. Svensk. Vetenskapsakad. Handl., lii., xii., 1916, p. 4) agree in referring Allman's genotype *D. dichotomus* also to *Ophiodes*, Billard stating: "Cet auteur (Allman) a créé à tort un genre nouveau, tout en faisant ressortir la grande ressemblance entre son genre *Diplocyathus* et le genre *Ophiodes* de Hincks. Je crois qu'il est logique de maintenir seul ce dernier et d'y placer toutes les espèces d'*Haleciidae* dont les hydrothèques sont semblables à celles d'*Halecium* mais qui possèdent des nématophores" (italics by present author). In our present state of ignorance, lacking as we do any considerable knowledge as to the part played by different kinds of nematophores, by virtue of their different values in determining the degree of successful adaptation to environment of the animals bearing them, in the evolution of different generic types, the author regards Billard's definition as the most logical and the least confusing. Among the species apparently retained by Stechow in the genus *Ophiiodissa* we find various forms of sarcothecae described, some (e.g., in *O. mirabilis*) slender and conical, approaching those of *Diplocyathus* in shape, others (e.g., in *O. australis* and *O. caciniiformis*) vase-shaped, approaching those of *Phylactotheca*; while even in the disposition of the sarcothecae there is little or no ground for separation, as in all three genera they may occur at the bases of the hydrophores, and in both *Ophiiodissa* and *Phylactotheca* on the internodes of the stem. Thus if *Phylactotheca* is to be regarded as a valid genus, it can only be, on the basis of Billard's definition, if the hydrophores are definitely not of the typical *Halecium*-form. Actually it seems that they are not, although the difference is much more marked in *P. pacifica* than in *P. armata*. The hydrophores of both these species are borne on distinct pedicillate processes, and even if it be conceded, as the present author formerly suggested (Proc. Roy. Soc. Vic., n.s., xlix., 1937, p. 365) that these processes in *P. armata* (referred to there under the name of "*Ophiiodissa fragilis*") are "probably representing the proximal ends of the hydrophores", it must still be admitted that they are differentiated from the stem to an unusually high degree; furthermore the hydrophores are much more campanulate in form than those of any species of *Halecium*, and lack the marginal ring of puncta. For these reasons it appears that the genus *Phylactotheca* should be regarded as valid; the genera *Hydrodendron*, *Diplocyathus*, and *Ophiiodissa* should however be regarded as falling under a single generic head, which must in accordance with the rules of scientific nomenclature be known as *Hydrodendron*, this being the earliest valid synonym of the preoccupied name *Ophiodes*.

Order: CALYPTOBLASTEA (LEPTOMEDUSAE).

Family: PLUMULARIIDAE.

Genus **Plumularia** Lamarck, 1816.

PLUMULARIA OBLIQUA (Johnston, 1847).

Laomedea obliqua Johnston, Hist. Brit. Zooph., 1847, p. 106, pl. xxviii., fig. i.

Plumularia obliqua (Johnston), Hincks, Ann. Mag. Nat. Hist., (3), viii., 1862, p. 258.

Reevesby (5f.), Partney and Blyth Islands; gonosomes not present. Previously recorded from various south-eastern Australian waters; also from European waters and Japan.

PLUMULARIA FLEXUOSA Bale, 1893.

Plumularia flexuosa Bale, Proc. Roy. Soc. Vic., n.s., vi., 1893, p. 95, pl. v., figs. vi.-x.

Totton (Brit. Antarct. Exped. Rep., Zool., v., v., 1930, p. 221) refers this species to *P. pulchella* Bale; the described differences in the gonangium, however, appear to justify its retention as a separate species.

Reevesby Island (littoral); gonosomes not present. Previously recorded from various southern Australian waters; also South Africa.

PLUMULARIA OBESA sp. nov.

(Fig. 1.)

Hydrorhiza very broad, with transverse markings along the margins; hydrocaulus monosiphonic, unbranched, from 1.0 to 1.5 mm. in height; stem thick, divided into short equal internodes; pinnae alternate, each borne at about the middle of an internode, and each supporting a single hydrotheca; distal part of pinna curved, becoming gradually reduced in thickness behind the hydrotheca. Hydrothecae rounded at the base, somewhat compressed laterally, considerably protruded outwards, aperture at right angles to the pinna, margin somewhat everted in front; a prominent intrathecal ridge springing from the pinna just below the aperture. Sarcothecae bithalamic, canaliculate, with slender bases, one (mesial) below each hydrotheca, one (supracalycine) at each side above it, and two in each axil. Gonosomes not present. Color deep blackish-brown.

This species, by virtue of its bithalamic sarcothecae, would be referred on Stechow's system of classification to the genus *Monotheca* Nutting, 1900. Although there appear to be typically two sarcothecae in each axil, in some cases only one can be seen; this may of course be due to the other having been broken off; in no case are there any at all, however, on the internodes themselves. The blackish color renders the form fairly distinctive in the field, while in microscopic preparations it can easily be

recognised by the very thick short internodes of the hydrocaulus, and by the very characteristic form of the hydrothecae. In this last respect, the species is possibly most similar to *P. spinulosa* Bale, although the greater outward extension from the pinna, the presence of a very sudden rather than a gradual upward curve, a gradual rather than a sudden diminution of the thickness of the distal end of the pinna behind the hydrotheca, the absence of a terminal spine and the fact that the intrathecal ridge is not noticeably directed towards the base of the hydrotheca again provide a basis for easy separation.

Reevesby (4-5f.) and Lusby Islands; on *Posidonia* weed.

PLUMULARIA COMPRESSA Bale, 1881.

Plumularia compressa Bale, Journ. Micr. Soc. Vic., ii., 1881, p. 43, pl. xv., fig. v.

Very common throughout the group; gonosomes sometimes present. Previously recorded from various southern Australian waters.

PLUMULARIA AUSTRALIS Kirchenpauer, 1876.

Plumularia obliqua Johnston var. *australis* Kirchenpauer, Abh. Ver. Hamburg, vi., 2, 1876, p. 49, pl. vi., fig. x.

Plumularia australis Kirchenpauer, Bale, Cat. Aust. Hyd. Zooph., 1884, p. 143, pl. xii., figs. vii.-viii., pl. xix., figs. xliii.-xliv.

Reevesby (5f.) and Hareby Islands; gonosomes sometimes present. Previously recorded from Victorian waters.

PLUMULARIA ANGUSTA Stechow, 1923.

Plumularia setaceoides Bale vars. *a*, *b*, *d* Mulder and Trebilcock, Geel, Nat., (2), iv., 4, 1911, pp. 117-118, pl. iii., figs. iii.-iiiB., vi., pl. ii., fig. ix.

Plumularia angusta Stechow, Zool. Jahrb., Syst., xlvii., 1923 *a*, p. 226.

Blyth Island; gonosomes not present. Previously recorded from Victorian waters.

PLUMULARIA SECUNDARIA Marktanner-Turneretscher, 1890.

Plumularia secundaria Marktanner-Turneretscher, Ann. k.k.naturhist. Hofmus., v., 1890, p. 252, pl. vi., fig. i.

Blyth Island; gonosomes occasionally present. Previously recorded from Victorian waters if *P. dubiaformis* Mulder and Trebilcock is admitted as a synonym; also from European seas, the N.W. and E. coasts of Africa, Natal, Azores, Madeira, Ceylon, Mergui Archipelago, East Indies, Japan and Tonga.

Genus **Thecocalus** Bale, 1915.

THECOCAULUS OPPOSITA (Mulder and Trebilcock, 1911), var.

(Fig. 2.)

Plumularia opposita Mulder and Trebilcock, loc. cit., 1911, pp. 120-121, pl. ii., figs. v., va.

Thecocalus oxyrhynchus Stechow, loc. cit., 1923 *a*, p. 223.

A single specimen of this species appears to constitute a distinct variety, by virtue of the stem-internodes; the alternate internodes which do not bear hydrothecae are much longer than in the typical form, being almost as long as the hydrotheca-bearing series, and each bears two sarcothecae, one above the other: the pinna-internodes are of the normal variety. The hydrothecae, though more or less campanulate in form, are slightly peaked in front, slightly sinuate behind, and exhibit the faintest traces of a rudimentary intrathecal ridge at the back; they may therefore be regarded as constituting a transition form between the hydrothecae of *T. opposita* and *T. opposita* var. *a*, for the second of which Stechow proposes the name *T. oxyrhynchus*, justifying this separation on the differences in the form of the hydrothecae. In view however of the existence of an intermediate form, the retention of the latter name for a separate species seems to the author unjustifiable.

Blyth Island; gonosomes not present. Previously recorded from Victorian waters.

Genus *Kirchenpaueria* Jickeli, 1883.

KIRCHENPAUERIA MIRABILIS (Allman, 1883).

Diplocheilus mirabilis Allman, Rep. Sci. Res. "Challenger", Zool. vii., 1883, p. 49, pl. viii, figs. iv.-vii.

Kirchenpaueria mirabilis (Allman), Bale, *loc. cit.*, 1893, p. 109, pl. vi, figs. iv.-vii.

? *Diplocheilus allmani* Torrey, Univ. Calif. Pub. Zool., ii., 1904, p. 36.

Near Lusby Island (4f.); gonosomes not present. Previously recorded from various southern Australian waters; also from Natal, New Zealand, and Japan, as well as California if *K. allmani* is admitted as a synonym.

KIRCHENPAUERIA PRODUCTA (Bale, 1881).

Plumularia producta Bale, *loc. cit.*, 1881, p. 39, pl. xv., fig. iii.

Kirchenpaueria producta (Bale), Bale, *loc. cit.*, 1893, p. 111.

? *Diplocheilus allmani* Torrey, *loc. cit.*, 1904, p. 36.

These specimens agree with *K. producta* in the details of the hydrotheca-profile, but approach *K. mirabilis* in size (specimens up to 2 cm. in height being not uncommonly observed) and in the tendency observed in many cases for the apertures of the hydrothecae to be more circular than elliptical, with flaring margins. It thus appears possible that, as Totton (*loc. cit.*, 1930, p. 216) has already suggested, these two forms may actually be referable to the same species, *K. producta*, although the profile characteristics of the hydrothecae and mesial sarcothecae are nevertheless fairly distinct in the two forms.

Reevesby Island (2-5f.); gonosomes not present. Previously recorded from various south-eastern Australian waters; also from California if *K. allmani* is admitted as a synonym. The author has also noted this species from near the mouth of the Johnstone River, North Queensland.

KIRCHENPAUERIA BISEPTATA sp. nov.

(Fig. 3.)

Hydrorhiza cylindrical, creeping; hydrocaulus monosiphonic, unbranched, from 2.5 to 4.5 mm. in height; stem thick, divided into short equal internodes; pinnae alternate, each borne at the base of a stem-internode, divided into equal internodes by straight joints; each pinnae-internode bearing a single hydrotheca. Hydrothecae set at an angle of about 40° to the pinna, bowl-shaped, but with the back much produced upwards, and with the front wall deeply inflected immediately below the lip, forming an anterior intrathecal ridge which extends three-quarters across the cavity of the hydrotheca; also a rudimentary posterior intrathecal ridge springing from the pinna at the back of the hydrotheca, at a lower level than the other. A single (mesial) monothalamic sarcotheca below each hydrotheca, fixed, erect, upper portion forming a circular concave shield facing and parallel to the base of the hydrotheca; a single median (supracalycline) sarcostyle in the angle between the back of each hydrotheca and the pinna, not provided with a sarcotheca, but partly protected on each side by a narrow web which connects the pinna with the back of the hydrotheca; a single conical sarcotheca in each axil. Gonosomes not present.

Only very small specimens of this form have so far been discovered, with a maximum of seven alternating pinnae on one stem and of four hydrothecae on one pinna; this feature may however be far from constant. The most striking characteristic of the species is undoubtedly the presence of the posterior intrathecal ridge, which distinguishes it readily from all other members of the genus. Seen from the front, the aperture of the hydrotheca appears more or less oval. It may be noted that the polypiferous ramules, corresponding to the pinnae of the typical colony, may arise directly from the hydrorhiza; the author has noted this also for the Banks Islands specimens of *K. mirabilis* and *K. producta*.

Reevesby (5f.) and Hareby Islands; on *Posidonia* and *Cymodocea* weed.

Genus **Aglaophenia** Lamouroux, 1812.

AGLAOPHENIA PLUMOSA Bale, 1881.

Aglaophenia plumosa Bale, loc. cit., 1881, p. 37, pl. xiv., fig. vi.

Hareby Island; gonosomes not present. Previously recorded from various southern Australian waters; also New Zealand and South Africa.

Family: SERTULARIIDAE.

Genus **Sertularia** Linnaeus, 1758.

SERTULARIA MINUSCULA Bale, 1919.

Sertularia minima Thompson var. *tubatheca* Mulder and Trebilcock, Geol. Nat., (2), vi., 2, 1914 b, p. 40, pl. iv., figs. i-id.

Sertularia minuscula Bale, Proc. Roy. Soc. Vic., n.s., xxxi., 1919, p. 340.

Very common throughout the group; gonosomes sometimes present. Previously recorded from various south-eastern Australian waters.

SERTULARIA MINIMA Thompson, 1879.

Sertularia minima Thompson, Ann. Mag. Nat. Hist., (5), iii., 1879, p. 104, pl. xvii., fig. iii.-iiiib.

Reevesby Island (littoral; 2-4f.); gonosomes not present. Previously recorded from various southern Australian waters; also New Zealand, Kermadec Islands, Chile, Falkland Islands, Suez, and the Cape of Good Hope.

SERTULARIA MARGINATA (Kirchenpauer, 1864).

Dynamena marginata Kirchenpauer, Verh. K. L.—C. deutsch. Akad. naturf., xxxi., 1864, p. 13, figs. viii.-viiiic.

Sertularia marginata (Kirchenpauer), Bale, Proc. Roy. Soc. Vic., n.s., xxvi., 1913, p. 125, pl. xii., fig. ix.

Near Lusby Island (4f.); gonosomes sometimes present. Previously recorded from Victorian waters; also New Zealand, the Atlantic and Pacific Oceans, West Indies, Cape Verde Islands, E. and N.W. Africa, and Antarctica.

SERTULARIA XANTHA (Stechow, 1923).

Sertularia divergens Busk, Voy. "Rattlesnake", i., 1852, p. 392.

Tridentata xantha Stechow, Zool. Anz., lvi., 1923 b, p. 12.

Sertularia xantha (Stechow), Bale, Proc. Roy. Soc. Vic., n.s., xxxviii., 1926, p. 15.

Reevesby Island (littoral); gonosomes not present. Previously recorded from various south-eastern Australian waters; also New Zealand, and the Philippines.

Genus **Dynamena** Lamouroux, 1812.

DYNAMENA CORNICINA McCrady, 1858.

Dynamena cornicina McCrady, Proc. Elliot Soc., i., i., 1858, p. 204.

Idem., Billard, Sci. Res. Siboga-Expd., Mono. viib., 1925, p. 71, pl. vii., fig. xxiii., text-fig. xl.

Sertularia complexa Clarke, Bull. Mus. Comp. Zool., v., x., 1879, p. 245, pl. iv., figs. xxvi.-xxviiiib.

Reevesby Island (littoral; 5f.) and Lusby Islands; gonosomes not present. Previously recorded from New South Wales; also California, Carolina, Massachusetts, Nova Scotia, Yucatan, Bermuda, Brazil, Mediterranean, East Africa, Ceylon, and the East Indies.

DYNAMENA QUADRIDENTATA (Ellis and Solander, 1786).

Sertularia quadridentata Ellis and Solander, Nat. Hist. Zooph., 1786, p. 57.

Pasythca quadridentata (Ellis and Solander), Esper, Die Pflanzen-thiere in Abbildungen, iii., 1788, p. 237.

Dynamena quadridentata (Ellis and Solander), Billard, *loc. cit.*, 1925, pp. 21, 78-82, text-figs. xlii., xliii.

Reevesby Island; gonosomes not present. Previously recorded from various southern and eastern Australian waters; also New Zealand, Loyalty Islands, Philippines, China, Hawaii, Carolina, Bahamas, Atlantic Ocean, Ascension, Natal, Mozambique, India, and the East Indies.

Genus **Sertularella** Gray, 1848.

SERTULARELLA PYGMAEA Bale, 1881.

Sertularella pygmaea Bale, *loc. cit.*, 1881, p. 25, pl. xii., fig. ix.

Roxby Island; gonosomes not present. Previously recorded from various south-eastern Australian waters; also New Zealand.

SERTULARELLA ROBUSTA Coughtrey, 1875.

Sertularia simplex Hutton, Coughtrey, Trans. N.Z. Inst., vii., 1874, p. 283 (pars), pl. xx., fig. x.

Sertularella robusta Coughtrey, Trans. N.Z. Inst., viii., 1875, p. 300.

In a former paper (Proc. Roy. Soc. Vic., n.s., 1. 1937, p. 172) the present author suggests the inclusion in the synonymy of this species of *Sertularella microgona* von Lendenfeld; Totton (*loc. cit.*, 1930, p. 195) whose reference to *S. robusta* had been overlooked at the time, confirms this in his statement that an examination of von Lendenfeld's types in the British Museum shows that the two species are in fact identical.

Reevesby Island (littoral); gonosomes not present. Previously recorded from Victorian waters; also New Zealand, the East Indies, and Tierra del Fuego.

Family: SYNTHECIIDAE.

Genus **Stereotheca** Stechow, 1919.

STEREOTHECA ELONGATA (Lamouroux, 1816).

Sertularia elongata Lamouroux, Hist. Polyp. Cor. Flex., 1816, p. 189, pl. v., figs. iii-iiic.

Stereotheca elongata (Lamouroux), Stechow, Zool. Jahrb., Syst., xlii., 1919, p. 103.

Reevesby Island; gonosomes often present. Previously recorded from various southern Australian waters; also New Zealand.

Family: CAMPANULINIDAE.

Genus **Parascyphus** Ritchie, 1911.

PARASCYPHUS SIMPLEX (Lamouroux, 1816).

Laomedea simplex Lamouroux, *loc. cit.*, 1816, p. 206.

Thyroscyphus simplex (Lamouroux), Billard, C. R., Acad. Sci., cxlviii., 1909, p. 1065.

Parascyphus simplex (Lamouroux), Ritchie, Ann. Scot. Nat. Hist. Edinb., xx., 1911, p. 160, fig. i.

Partney Island; gonosomes not present. Previously recorded from various southern Australian waters; also New Zealand, Great Britain, and the South Atlantic.

Family: LINEOLARIIDAE.

Genus **Lineolaria** Hincks, 1861.

LINEOLARIA FLEXUOSA Bale, 1884.

Lineolaria flexuosa Bale, *loc. cit.*, 1884, p. 62, pl. i., figs. vii.-ix.

In these specimens the hydrorhiza is actually more often straight, or nearly so, than flexuous, and the hydrothecae, instead of always lying parallel to it, are frequently disposed at right angles to it. The free part of the hydrotheca is generally as long as the adnate portion. A lateral wing or expansion may also be observed.

Reevesby Island; gonosomes present. Previously recorded from Victorian waters; also New Zealand.

LINEOLARIA INARMATA sp. nov.

(Figs. 4-8.)

Hydrorhiza straight, convex above, slightly wrinkled transversely; branching processes given off at right angles, often anastomosing. Hydrothecae usually regularly alternate, occasionally opposite, not close, subsessile, projecting at right angles to the hydrorhiza, oblong, slightly broader at the base; aperture terminal, oval, looking upwards, with a slightly everted margin and a membranous operculum.

Gonosome (gonangium) compressed, about twice the length of a hydrotheca, irregularly ovate, tapering towards the base, with a row of strong spines running down each side and meeting below, and a few scattered spines in the central area; orifice subterminal, circular, looking upwards, with a thickened and slightly elevated margin surrounded by a few minute denticles.

Hydrothecae and gonangia furnished with a delicate lateral wing or expansion, surrounding the whole margin and apparently adherent to the supporting substance.

This species forms very distinct regularly anastomosing patterns on the leaves of the *Posidonia* weed, and in this habit and in its superficial structure bears a very close resemblance to

L. spinulosa Hincks, though the latter form is stated by Bale to be peculiar to *Cymodocea*. There are however several points of difference between the two, of which the absence of a basal spine and marginal teeth in the species under discussion are perhaps the most conspicuous. The hydrothecae of this species are furthermore slightly longer than those of *L. spinulosa* and are generally more regularly oblong, the basal widening being rather less conspicuous, while the gonangium is usually much less regular in shape.

Reevesby (2-2½f.) and Lusby Islands; on *Posidonia* weed.

Family: HALECIIDAE.

Genus **Halecium** Oken, 1815.

HALECIUM MEDITERRANEUM Weismann, 1883.

Halecium tenellum Hincks var. *mediterranea* Weismann, Entstehung d. Sexualzellen b.d. Hydromedusen, 1883, p. 160, pl. xi., figs. v.-vi.

Halecium mediterraneum Weismann, Stechow, loc. cit., 1919, p. 34.

Halecium flexile Allman, Rep. Sci. Res. "Challenger", Zool., xxiii., 1888, p. 11, pl. v., figs. ii., iii.

Reevesby Island (2-5f.) and near Lusby Island (4f.); gonosomes sometimes present. Previously recorded from various south-eastern Australian waters; also New Zealand, Antarctica, Japan, Patagonia, Nicaragua, California, Puget Sound, West Africa, Mediterranean, Ceylon, and Marion Island.

HALECIUM sp.

Hydrorhiza creeping, more or less smooth; hydrocaulus very small, about 0.2 to 0.3 mm. in height and about 0.1 mm. in diameter, consisting of corrugated pedicillate stems each bearing a terminal hydrophore, with sometimes a secondary hydrophore arising on a short corrugated pedicillate "branch" from the side of the first; hydrophores not distinctly marked off from the stems, tumbler-shaped, margins somewhat expanded and distinctly everted, the whole hydrophore sometimes duplicated. Hydranths large, non-retractile, with about sixteen tentacles. Gonosomes not present.

This species appears to be fairly closely related to *H. corrugatum* Nutting, although the latter is often quite distinctly branched, with the stems much longer in proportion to their diameter, and with more broadly expanded and less distinctly everted hydrophore-margins. It may possibly represent a new species, but as the material is very scanty and so much obscured by foreign material as to render accurate figuring impossible, its exact systematic position must remain indefinite.

Reevesby Island (littoral).

Genus **Phylactotheca** Stechow, 1913.

PHYLACTOTHECA ARMATA Stechow, 1924.

Phylactotheca armata Stechow, Zool. Anz., lix., 1924, p. 59. *Idem*, Stechow, Zool. Jahrb., Syst., l., 1925, p. 204, fig. C.

Ophiodissa fragilis Blackburn, Proc. Roy. Soc. Vic., n.s., xlix., 1937, p. 365, fig. i.

The species, which the present author previously referred on account of its sarcothecae and capitate dactylozooids to the genus *Ophiodissa* and described as new under the name of *O. fragilis*, is unquestionably identical with *Phylactotheca armata*. In his original unfigured description Stechow states: "Der Stamm abwechselnd aus einem längeren cladien tragenden und einem kürzeren cladien lösen Glied bestehend . . . "; this character is not to be observed in any of the Victorian specimens, and in the absence of any figure the author regarded the two forms as quite distinct. One of the specimens from the Banks Islands however exhibits to a very slight degree this tendency towards a differentiation of the internodes, and reference to Stechow's figure of *P. armata* in a later paper shows clearly that the two forms are in all other respects identical. One of these specimens also exhibits a slightly branching habit, each branch consisting, like the stem, of a regular succession of hydrophore-bearing internodes, in contrast to the branch-like elongated hydrophore-peduncles described by the author previously.

The question of the validity of this genus has already been discussed (*vide supra*).

Near Lusby Island (4f.); gonosomes not present. Previously recorded from various southern Australian waters.

Family: CAMPANULARIIDAE.

Genus **Campanularia** Lamarck, 1816.

CAMPANULARIA AUSTRALIS Stechow, 1924.

Campanularia tinctoria Hincks var. *c* Mulder and Trebilcock, Geol. Nat. (2), vi, i., 1914 a, p. 13, pl. ii., fig. xii., *idem*, Mulder and Trebilcock, Geol. Nat., (2), vi., iii., 1915, p. 56, pl. viii., figs. ii.-iif.

Campanularia australis Stechow, *loc. cit.*, 1924, p. 61.

The bilateral symmetry of the hydrothecae, already referred to in this paper (*vide supra*) is well marked in these specimens.

Reevesby (5f.). Hareby and (?) Spilsby Islands; gonosomes not present. Previously recorded from various southern Australian waters.

(?) **CAMPANULARIA PULCRATHECA** Mulder and Trebilcock, 1914.

Campanularia pulcrathea Mulder and Trebilcock, *loc. cit.*, 1914 a, p. 11, pl. ii., figs. i.-ii.

Paracalix pulcrathea (Mulder and Trebilcock), Stechow, *loc. cit.*, 1923, a, p. 106.

The validity of the proposed genus *Paracalix* has already been discussed (*vide supra*); even after suppressing it however the species can only tentatively, in the absence of the gonosome, be referred to the genus *Campanularia*.

(?) Spilsby Island; gonosomes not present. Previously recorded from Victorian waters.

Genus **Orthopyxis** L. Agassiz, 1862.

ORTHOPYXIS cf. **MACROGONA** (von Lendenfeld, 1884).

Campanulina calyculata (Hincks) var. *makrogona* von Lendenfeld, *proc. Linn. Soc., N.S.W.*, ix., 1884, p. 922.

Campanularia calyculata Hincks var. *makrogona* (von Lendenfeld). Bale, *Proc. Linn. Soc. N.S.W.*, (2), iii., 1888, p. 755, pl. xiii., figs. iv.-viii.

Orthopyxis makrogona (von Lendenfeld), Bale, *Proc. Roy. Soc. Vic.*, n.s., xxvii., 1914, p. 77, pl. xi., fig. ii., pl. xii., fig. ii.

Reevesby Island (5f.); gonosomes not present, rendering it difficult, in the absence of any considerable material, to diagnose the specimens exactly. *O. makrogona* has previously been recorded from various south-eastern Australian waters; also from New Zealand.

Genus **Silicularia** Meyen, 1834.

SILICULARIA UNDULATA (Mulder and Trebilcock, 1914).

Eucopella undulata Mulder and Trebilcock, *loc. cit.*, 1914 a, p. 10, pl. ii., figs. v.-vii.

Silicularia undulata (Mulder and Trebilcock), Bale, *loc. cit.*, 1914, p. 89.

Reevesby (4f.) and Lusby Islands; gonosomes not present. Previously recorded from Victorian waters.

Genus **Obelia** Péron and Lesueur, 1809.

OBELIA AUSTRALIS von Lendenfeld, 1884.

Obelia australis von Lendenfeld, *loc. cit.*, 1884, pp. 604, 920, pl. xliii., figs. xix.-xxii.

The hydrothecae in these specimens are often longitudinally pleated; this character is often given as a characteristic of *O. dichotoma* Linnaeus, to which this form is very closely related.

Reevesby (littoral; 5f.) and Lusby Islands; gonosomes not present. Previously recorded from Victorian waters, possibly also from New South Wales; also New Zealand.

Genus **Clytia** Lamouroux, 1812.

CLYTIA DELICATULA (Thornely, 1900).

Obelia delicatula Thornely, Willey's Zoo. Res., iv., 1900, p. 453, pl. xliv., fig. vii.

Clytia delicatula (Thornely), Stechow, Abh. Math.-Phys. Klasse K. Bayr. Akad. Wiss., iii., Suppl.-Bd., ii., Abh., 1913, p. 65, figs. xx., xxi.

One of these specimens has the distal half of the pedicel irregularly waved throughout. The longitudinal folding of the hydrotheca-walls is well seen in specimens in which the hydranths are retracted.

Reevesby (5f.) and Lushy Islands; a single distorted gonangium noted. Previously recorded from the eastern coast of Australia (Great Barrier Reef; Mallacoota Inlet); also New Britain, Japan, and the Philippines.

(?) CLYTIA STOLONIFERA sp. nov.

(Figs. 9-10.)

Colony creeping, consisting of a smooth anastomosing hydrorhiza giving rise to erect thecate shoots and creeping stem-like stolons; stolons with about six annulations at the base, giving rise to erect thecate shoots similar to those arising directly from the hydrorhiza; shoots up to 4 mm. in height, generally much less, with a varying number of annulations at the base, generally slightly branched and bearing hydrothecae mounted on pedicels; branches arising singly at origins of pedicels, with about six annulations at the base, terminating in hydrotheca-pedicels from the bases of which similar branches may arise in like fashion. Hydrothecae campanulate, borne on pedicels, in the expanded condition about as deep as their greatest breadth, distal three-quarters very broadly conical, proximal quarter much more cylindrical, this latter part bounded distally by a thick diaphragm, margin with about 14 shallow rounded crenations; pedicels generally about as long as hydrothecae, tapering distally and with about four to eight annulations on the distal portion. Hydranths with trumpet-shaped hypostome and about 20 tentacles. Gonosomes not present.

This curious form differs from all other recorded Campanularians in the extent of its adaptation to an epiphytic way of life: the stolons are annulated at the base as in the erect shoots, which, like them, originate from the hydrorhiza; but they appear, instead of assuming an erect posture and giving off a more or less regular succession of hydrotheca-pedicels and branches as the shoots do, to remain approximated like the hydrorhiza to the supporting seaweed, pursuing a quite irregular creeping course and giving off short erect shoots at rather irregular intervals. These stolons can be sharply distinguished from the shoots in microscopic preparations by the character of

the perisarc, which is as one might expect as thick as that of the hydrorhiza, in contrast to that of the shoots, which is quite thin, except sometimes at their bases; the last observation points to a creeping habit here also, possibly representing a stage in the formation of the stolons, though this was not specifically noted *in situ*.

This form of growth appears to have arisen as a result of the assumption in great part by the stems of the colony of a creeping posture, as a result of which these structures have lost almost all trace (except the basal annulations) of their typical form. The author has compared it with descriptions of all recorded Campanularian genera and species to which references were available, and with descriptions of many other Hydrozoan forms, and has found no mention of a similar case. A certain type of secondary stoloniferous growth, in which the ends of the erect branches may be occasionally produced into creeping growths from which other shoots arise, has been described in various forms for a few species of Hydrozoa: under aquarial conditions, colonies of *Syncoryne eximia* Allman and *Bougainvillia muscus* Allman (Browne, Journ. Mar. Biol. Ass. Plymouth, n.s., viii., 1907, p. 37) and of *Kirichenpaucria* (*Plumularia*) *pinnata* Linnaeus (Nutting, Amer. Hyd., Plum., 1900, p. 43) have been known to attach themselves to the glass walls by means of such stolons; in *Cnidoscyphus marginatus* Allman (*Campanularia insignis* Allman) "the outgrowths arise from the ends of the stems and branches or may replace the latter. They are present in colonies of all sizes and are most abundant at the distal end. By their elongation, sometimes aided by a bending of the colony, their tips come in contact with the substratum. A group of rhizoids forms and a new colony rises from them. Only a small proportion of the stolons were engaged in this process" (Congdon, Proc. Amer. Acad. Arts. Sci., xlii., 1907, p. 469); in *Obelia surcularis* Calkins (Nutting, Amer. Hyd. Camp., 1915, p. 84) and *Campanularia angulata* Hincks (Hincks, Hist. Brit. Hyd. Zooph., 1868, p. 170), as well as in the form under discussion, the branches are sometimes found to terminate in elongated tendril-like filaments which may represent stolons of this type, although shoots have not been observed to arise from them; and in (?) *Campanularia serrulatella* Borradaile (*Obelia serrulata* (Bale), Thornely, Willey's Zoo. Res., iv., 1900, p. 453) and *Obelia nodosa* Bale (Bale, Trans. N.Z. Inst., lv., 1924, p. 230) the lower part of the stem is often fascicled owing to the downgrowth of such stolons towards the hydrorhiza. Except in the last instance, however, and possibly even there, none of these types of stoloniferous growth are of regular occurrence and none are of so fundamental a character as that found in this species.

The hydrothecae of this form are also quite characteristic; they are extremely broadly conical in the relaxed condition, though in other cases (apparently to be correlated with the retraction of the hydranths) they may appear relatively much more cylindrical. In their superficial appearance they approach fairly closely those of (?) *Campanularia obtusidens* Jaderholm, (?) *C. serrulatella* Borradaile and *Obelia coughtreysi* Bale, but even here the combination of characters found in the form under discussion (character of diaphragm, number and shape of teeth, relative dimensions, &c.) provide for easy separation.

In the absence of any gonosomal structures the generic position of this species must remain very obscure; it is here tentatively referred to *Clytia* on account of the nature of its branching, the presence of a thick diaphragm and the character of the hydranths, although none of these features are absolutely characteristic of this genus and all may be found in other genera.

Reevesby Island (4f.); on Posidonia weed.

Incertae Sedis.

Gen. and sp. indet. (medusa).

Two specimens of a species of Leptomedusan are included in the collection. They are however so much crumpled that it has proved impossible to mount them in such a way as to be able to determine whether or not otocysts are present, as a result of which it is impossible to assign the form even to its family.

Near Marum Island, floating.

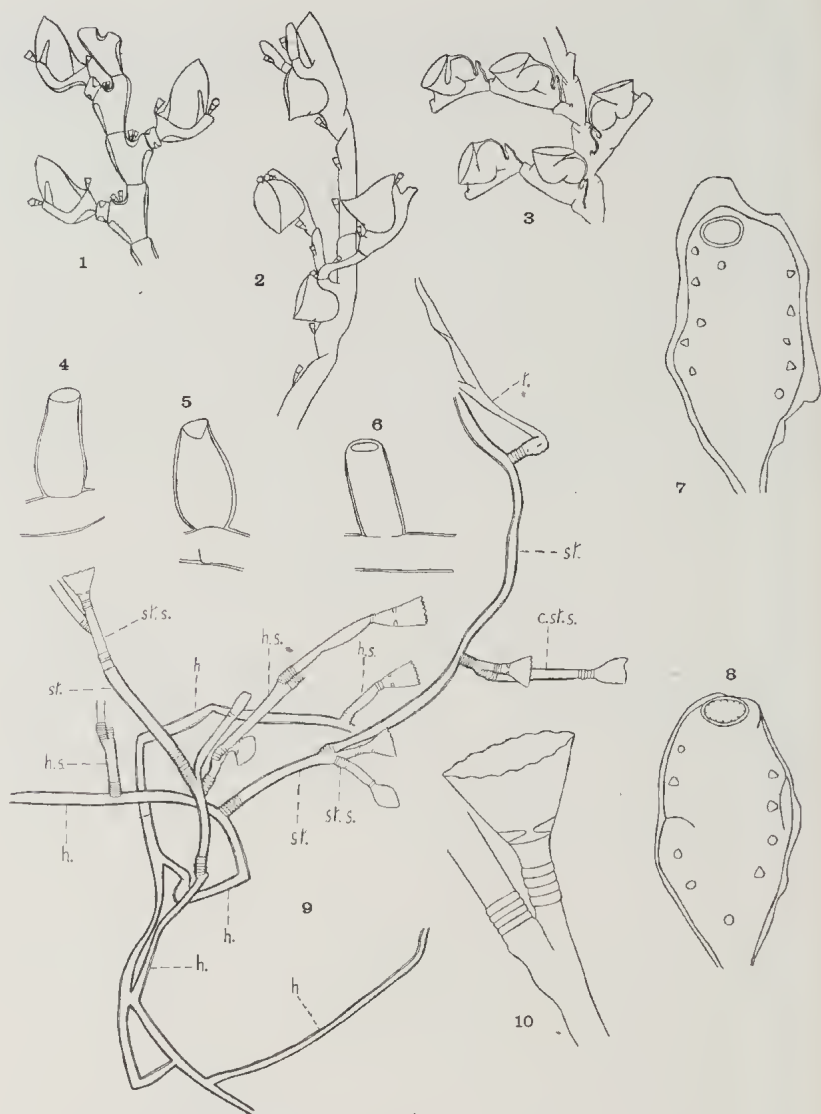


Fig. 1. *Plumularia obesa* sp. nov. ($\times 28$).

Fig. 2. *Thecocalus opposita* (Mulder and Trebilcock) var. ($\times 28$).

Fig. 3. *Kirchenpaueria biseptata* sp. nov. ($\times 14$).

Figs. 4-6. *Lineolaria inarmata* sp. nov., hydrothecae ($\times 28$).

Figs. 7, 8. *Lineolaria inarmata* sp. nov., gonangia ($\times 28$).

Fig. 9. (?) *Clytia stolonifera* sp. nov., whole colony ($\times 8$); h., hydrorhiza; st., stolon; h.s., hydrorhizal shoot; st.s., stolon shoot; c.st.s., creeping stolon shoot; t., tendril-like, (?) stolon filament of shoot.

Fig. 10. (?) *Clytia stolonifera* sp. nov., hydrotheca ($\times 28$).

4. Echinodermata.

By LEO. W. STACH, M.Sc.

The prolific echinoderm fauna of the coast and offshore waters of Reevesby Island afforded opportunity for the study of the distribution of species in relation to habitat. Two environments were the subject of particular study and showed striking faunal dissimilarity.

Along the coast, granitic reefs are exposed at low tide. Collections were made from the reef at the south end of McCoy Bay on the east side of the island and an isolated patch at the end of a long sand spit on the west coast, known locally as Middle Rocks. These two localities consisted of rounded outcrops of granitic rock dissected by deep narrow joint planes with areas of boulders and small pebbles; there were but few algae at the former locality, and large boulders with clumps of the alga *Scaberia Agardhii* Greville growing between at the latter locality. Both these habitats carry abundant specimens of *Patiriella gunnii*, *Tosia australis* (predominantly *astrologorum* type), *Allostichaster polyplax*, *Ophionereis schayeri* and *Heliocidaris erythrogramma*, while *Petricia vernicina* was found abundantly on the granitic reef at McCoy Bay, but not at Middle Rocks. At the latter locality, however, one specimen of *Coscinasterias calamaria* and a juvenile *Goniocidaris geranioides tubaria* were collected.

The offshore locality intensively studied was the *Posidonia australis* bank off the east end of Lusby Island, facing Reevesby Island and connected to it by a probably granitic barrier at little depth. Just on the northern side of this barrier a sand accumulation has afforded a suitable environment for the development of a dense growth of *Posidonia australis* J. Hooker which affords protection for large numbers of razor shells and scallops. The tidal outflow at this point is surprisingly rapid and thus increases food supply and aeration. At low tide the *Posidonia* bank is covered by only one to two feet of water and a thorough examination of the fauna could be made by wading. The echinoderms are particularly abundant, as many as twenty to thirty occurring in one square yard. *Tosia australis* (predominantly *australis* type), *Uniophora sinusoida* and *U. multispina*, *Goniocidaris* and *Amblypneustes pallidus* are very common, while *Nectria ocellata* and *Petricia vernicina* are of rarer occurrence.

This occurrence of *Goniocidaris* is remarkable, since, from the writer's experience in Western Port, Victoria, it is never found there at depths of less than three or four fathoms and is very common at greater depths. The restriction of all the *Uniophora* to the *Posidonia* habitat is also noteworthy.

The large *Unio phora sinusoida* apparently feeds on the abundant bivalves of the *Posidonia* bank, while *Heliocidaris erythrogramma* forms part of the diet of the Pacific Gull, *Gabianus pacificus* (Latham, 1801), which catches them at low tide and breaks them by dropping on to the granitic platforms of the east coast, which are strewn with broken tests.

Class: ASTEROIDEA.

Order: PHANEROZONIA.

Family: GONIASTERIDAE.

NECTRIA OCELLATA Perrier, 1876.

Nectria ocellata Perrier, 1876, Arch. Zool. Exp. v., p. 4.

A single specimen only from the *Posidonia* bank off the east end of Lusby Island. Victorian specimens in the National Museum, Melbourne, are from Beaumaris, in Port Phillip Bay.

TOSIA AUSTRALIS Gray, 1840.

(Plate XVIII., figs. 3, 4.)

Tosia australis Gray, 1840, Ann. Mag., Nat. Hist., ser. 1, vi., p. 281.

Livingstone, 1932, Rec. Aust. Mus., xviii., (7), p. 375.

This species occurred prolifically at both localities mentioned below and less commonly at Middle Rocks. The "*australis*" form predominates greatly (seven out of the eight) in the series from the *Posidonia* bank off the east end of Lusby Island, one specimen only showing a variation in that the superomarginal plates of one side are reduced to five. Five of the series of six from the granitic reef at the south end of McCoy Bay are of the "*astrologorum*" type and four show marked variation in the number of superomarginal plates. The specimen of the *australis* type has two sides with eight plates and three sides with seven; the remaining specimens have (*a*) one side with six plates, two with seven, one with eight, and one with nine, (*b*) one side with six plates, three with seven, and one with eight, (*c*) four sides with six plates and one with seven.

It is of interest to note the predominance of the two extremes of this species in two widely different habitats, those from the granite reef also showing much greater variation, always in the form of an increase in the number of superomarginal plates, which is probably due to regeneration of fragmented plates damaged by stones rolled about by wave action on the exposed reefs.

Family: ASTEROPIDAE.

PETRICIA VERNICINA (Lamarck, 1816).

(Plate XVIII., figs. 1, 2.)

Asterias vernicina Lamarck, 1816, Anim. s. Vert., ii., p. 554.

Petricia vernicina (Lamarck), Clark, 1928, Rec. Sth. Aust. Mus., iii., (4), p. 388.

This species occurs commonly on the granitic reef at the south end of McCoy Bay and only rarely on the *Posidonia* bank off the east end of Lusby Island. In life it is a brilliant brick-red in colour. One four-armed specimen (Plate XVIII., fig. 1), with the typical large pedicellariae at the base of three only of the rays, was collected from the *Posidonia* bank. Victorian specimens in the National Museum, Melbourne, are from Cheltenham, Beaumaris, and South Brighton, in Port Phillip Bay.

Order: SPINULOSA.

Family: ASTERINIDAE.

PATIRIELLA GUNNII (Gray, 1840).

Asterina gunnii Gray, 1840, loc. cit., p. 289.

Patiriella gunnii (Gray), Clark, 1928, loc. cit., p. 392.

Abundant at the granitic reef in McCoy Bay and at Middle Rocks.

Family: ASTERIIDAE.

COSCINASTERIAS CALAMARIA (Gray, 1840).

Asterias calamaria Gray, 1840, loc. cit., p. 179.

Coscinasterias calamaria (Gray), Clark, 1928, loc. cit., & p. 399.

Found only at Middle Rocks, off the west coast of Reevesby Island.

ALLOSTICHAETER POLYPLAX Verrill, 1914.

Allostichaster polyplax Verrill, 1914, Harriman Alaska Exped., Starfishes, p. 363.

Fairly common on the granitic reef at the south end of McCoy Bay and at Middle Rocks.

UNIOPHORA SINUSOIDA (Perrier, 1875).

(Plate XVIII., figs. 5, 6.)

Asterias sinusoida Perrier, 1875, Arch. Zool. Exp., iv., p. 338.

Uniophora sinusoida (Perrier), Clark, 1928, loc. cit., p. 411.

This large *Uniophora*, of which two examples were collected, one having $R = 85$ mm. and the other $R = 70$ mm., is fairly common on the *Posidonia* bank off Lusby Island. In the radii of the large specimen and, less conspicuously, in the smaller

specimen, the zigzag row of capitate carinal spines combines with the dorsolateral spines to enclose unarmed polygonal areas which are characteristic of this form. The detail of the armature of the actinal surface is shown in Plate XVIII., fig. 5.

UNIOPHORA MULTISPINA MULTISPINA Clark, 1928.

(Plate XVIII., fig. 9.)

Uniophora multispina Clark, 1928, *loc. cit.*, p. 407, text-figs. 119, a, b.

Four specimens from the *Posidonia* bank off the east end of Lusby Island.

UNIOPHORA MULTISPINA UNISERIALIS Clark, 1928.

(Plate XVIII., figs. 7, 8.)

Uniophora uniserialis Clark, 1928, *loc. cit.*, p. 413, text-figs. 122, a, b.

Including the four specimens recorded above as *U. multispina multispina*, a series of fourteen small *Uniophora* all having the conspicuous madreporite surrounded by nine to twelve unequal spines were gathered from the *Posidonia* bank off the east end of Lusby Island. The carinal series of the radii of ten specimens has the fifteen stout conical spines described by Clark for *U. uniserialis*. The remaining four specimens (listed above as *U. multispina multispina*) agree in all characters with the *uniserialis* series except for an increase in the number of carinal spines, which tend to become capitate, and a slightly greater number of dorsolateral spines in two cases; in the remaining two specimens the number of dorsolateral spines is much greater, the carinal series being unaffected. This series demonstrates an intergradation between *U. multispina* and *U. uniserialis*, the latter being here regarded as a variety of the former.

One specimen of *U. multispina uniserialis* has six radii.

Class: OPHIUROIDEA.

Order: CHILOPHIURIDA.

Family: OPHIOCHITONIDAE.

OPHIONEREIS SCHAYERI (Müller and Troschel, 1844).

Ophiolepis schayeri Müller and Troschel, 1844, Arch. für Naturg., x., p. 182.

Ophionereis schayeri (M. and T.), Stach, 1937, Proc. Roy. Soc. Vic., n.s., xlix., p. 373.

This form occurs fairly commonly at Middle Rocks and the granitic reefs of the east coast of Reevesby Island.

Class: ECHINOIDEA.

Order: CIDAROIDA.

Family: CIDARIDAE.

GONIOCIDARIS GERANOIDES TUBARIA (Lamarck, 1816).

(Plate XVIII., figs. 10a-e.)

Cidarites tubaria Lamarck, 1816, *loc. cit.*, p. 57.

Goniocidaris geranioides tubaria (Lamarck), Clark, 1928, *loc. cit.*, p. 455.

This form is excessively common on the *Posidonia* bank off the east end of Lushy Island, where as many as six or seven per square yard were found. All the specimens from this habitat are very constant in their dimensions and in the form of the spines, those from the middle region of the test being broad and flat distally and marked with narrow ridges, spinous projections being absent; in the abactinal region, the spines are pointed and bear a few low conical elevations. The single specimen (juvenile), collected from Middle Rocks, contrasts strongly in that the spines are conspicuously thorny and taper distally.

Order: CENTRECHINOIDA.

Family: TEMNOPLEURIDAE.

AMBLYPNEUSTES OVUM OVUM (Lamarck, 1816).

Echinus ovum Lamarck, 1816, *loc. cit.*, p. 48.

Amblypneustes ovum (Lamarck), Clark, 1928, *loc. cit.*, p. 464.

One specimen dredged at six to eight fathoms on *Posidonia* off the north-west corner of Spilsby Island.

AMBLYPNEUSTES OVUM PACHISTA Clark, 1912.

Amblypneustes pachistus Clark, 1912, *Mem. Mus. Comp. Zool.*, xxxiv., p. 327.

A. ovum pachista Clark, 1928, *loc. cit.*, p. 465.

One specimen washed up in Nicholas Bay.

AMBLYPNEUSTES PALLIDUS (Lamarck, 1816).

Echinus pallidus Lamarck, 1816, *loc. cit.*, p. 48.

Amblypneustes pallidus (Lamarck), Clark, 1928, *loc. cit.*, p. 465.

This form occurs fairly commonly on the *Posidonia* bank off the east end of Lushy Island and specimens were also found washed up in Nicholas Bay, McCoy Bay, and Moreton Bay. In the series from the *Posidonia* bank, the primary spines are constantly light green and the small spines white, while those washed up in Nicholas Bay have light purple primaries and pale green small spines.

Family: STRONGYLOCENTROTIDAE.

HELIOCIDARIS ERYTHROGRAMMA (Valenciennes, 1846).*Echinus erythrogrammus* Valenciennes, 1846, Voy. "Venus", Zooph., pl. vii., fig. 1.*Heliocidaris erythrogramma* (Val.), Clark, 1928, *loc. cit.*, p. 468.

This species occurs commonly on the reefs of the east coast of Reevesby Island where it forms part of the diet of the Pacific Gull and also at Middle Rocks on the west coast. It is a typical member of rocky reef faunas along the southern coast of Australia.

Class: HOLOTHUROIDEA.

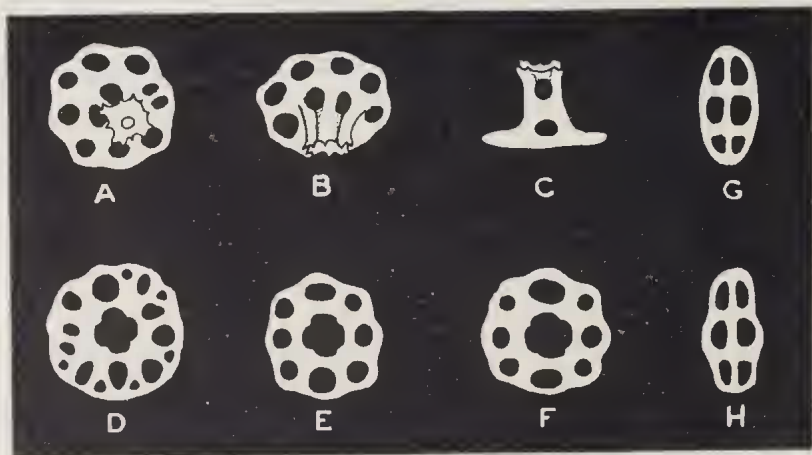
Order: ASPIDOCHIROTA.

Family: HOLOTHURIIDAE.

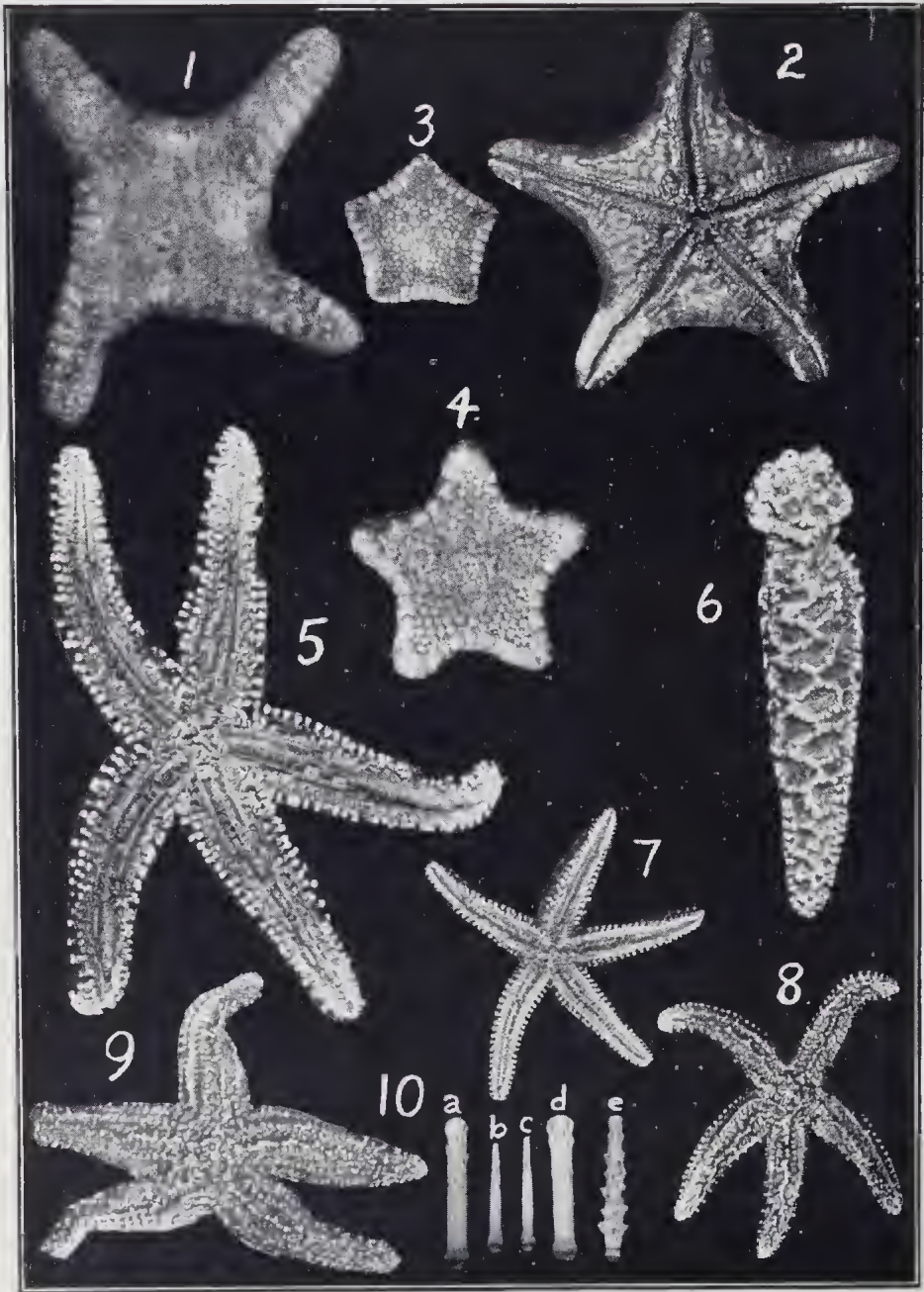
HOLOTHURIA aff. *MONACARIA* Lesson, 1830.*Holothuria monacaria* Lesson, 1830, Cent. Zool., pl. viii., fig. 10.

Théel, 1885, Challenger Repts., Zool., pt. xxxix., p. 172

This single specimen dredged from the *Posidonia* banks between Reevesby and Winceby Islands at four fathoms is very contracted, but approaches closely to Théel's description of such examples. The calcareous deposits (text-figs. 1A-H) are very similar to those figured for *H. monacaria*. The buttons are identical, but the perforations of the discs of the tables vary slightly in their arrangement.



TEXT-FIGURE 1.—Calcareous deposits of *Holothuria* aff. *monacaria* from four fathoms between Reevesby and Winceby Islands. X 280. A-C, tables showing spire; D-F, various arrangements of the perforations of the discs of the tables; G, H, two variations of the buttons.



Echinodermata of Banks Group.

Order: DENDROCHIROTA.

Family: CUCUMARIIDAE.

CUCUMARIA MUTANS Joshua, 1914.

Cucumaria mutans Joshua, 1914, Proc. Roy. Soc. Vic., n.s., xxvii., (1), p. 4, pl. i., figs. 1 a-d.

One typical purplish-black juvenile was collected at Middle Rocks.

Explanation of Plate XVIII.

(Magnification $\times .5$.)

- Fig. 1.—*Pctricia vernicina* (Lamarck, 1816). Four-armed specimen from *Posidonia* bank off east end of Lusby Island, Nat. Mus. Coll. No. 70625.
- Fig. 2.—*P. vernicina*. Actinal surface of five-armed specimen, Nat. Mus. Coll. No. 70626.
- Fig. 3.—*Tosia australis* Gray, 1840. Abnormal specimen of "*australis*" type from reef at south end of McCoy Bay, Nat. Mus. Coll. No. 70628.
- Fig. 4.—*T. australis*. Abnormal specimen of "*astrologorum*" type due to fragmentation of superomarginal plates, Nat. Mus. Coll. No. 60627.
- Figs. 5, 6.—*Unioophora sinusoida* (Perrier, 1875). From *Posidonia* bank off east end of Lusby Island, Nat. Mus. Coll. Nos. 70622, 70620.
- Figs. 7, 8.—*U. multispina uniserialis* Clark, 1928. From *Posidonia* bank off east end of Lusby Island, Nat. Mus. Coll. Nos. 70624, 70621.
- Fig. 9.—*U. multispina multispina* Clark, 1928. Same locality as *U. multispina uniserialis*, Nat. Mus. Coll. No. 70623.
- Fig. 10.—*Goniocidaris geranoides tubaria* (Lamarck, 1816). A-D. Spines from specimen from *Posidonia* bank off east end of Lusby Island; E. Spine from specimen taken from Middle Rocks.

5. *Mollusca, Part I.: The Spermatophore of* *Rossia australis*
Berry.

By BERNARD COTTON, Conchologist, South
Australian Museum.

Four specimens of *Rossia australis* Berry, one male and three females, were taken from off the west coast of Reevesby Island, South Australia, at a depth of 4 feet, during December, 1936. The species has not been previously taken in South Australia.

The male was dissected and the Needham's Sac was found to be filled with spermatophores. A large number of these were mounted in gum chloral instead of glycerine jelly as previously used by the author. Photo-micrographs are here reproduced, and the different features of the spermatophores are indicated on the plates. The photo-micrographs were made by projection through a microprojector directly on to a sheet of photographic paper.

Except for six specimens the spermatophores were mature and a typical specimen (pl. XIX., fig. 2), and an immature one (pl. XIX., fig. 1) are figured. The following is a description of the spermatophore.

An average mature spermatophore measures in length 6.5 mm., and 0.5 mm. across the sheath near the sperm tube. It will be noticed that the sperm tube in the one specimen is twice as long as in the immature, while the so-called false tube is inversely proportional in length. In the immature specimen the sheath is more globular and blunt aborally. It is in this immature state that the spermatophore enters the Needham's Sac, while the outer sheaths, "thin and presumably in the process of formation" (Verco and Cotton) (Proc. Mal. Soc., XIX., pt. IV., Mar., 1931, p. 169), are found in the seminal vesicle. One concludes that the sperm tube is completely developed shortly after entering into the Needham's Sac, and simultaneously there is a reduction in the length of the false tube.

This relative state of development is mentioned here as it has been stated by Russell (Fisheries Scotland, Sci., Invest., 1921, III, Feb., 1922, p. 31), that "there is every reason for supposing the shape of the spermatophore to be a good specific character; for it is just these apparently insignificant and non-adaptive characters which are the best distinguishing marks of allied species." This statement seems reasonably correct providing mature spermatophores are examined, but it appears that microscopic structural peculiarities should also be studied as well as the mere shape, before any specific identification can be confirmed.

An enlargement of the median portion of the spermatophore (pl. XX., left, fig. 1) shows the upper and lower sac, the connective, the base of the oral tube, the false tube and the upper end of

the sperm tube. The oral tube (pl. XX., right, fig. 2) coiled at the oral end is shown greatly enlarged and the position of the asteroid corpuscles can be distinguished as minute grains in the axial canal.

Verco and Cotton (*loc. cit.*, p. 170) described an experimental method of inducing the rupture of spermatophores. After preserving fresh specimens in glycerine, water was added drop by drop to reduce the specific gravity of the liquid and the spermatophores absorbed the solution slowly and finally ruptured. It has since been found that after three months' immersion in glycerine the rupture still occurs within fifteen seconds of immersion in water. The specimens of *Rossia australis* examined had been preserved in weak formalin for a period of nine months, so that it was thought that the spermatophores would not react to this experiment. They were, however, removed from the Needham's Sac and placed in glycerine prior to mounting. A few days later odd ones were transferred to water, and each ruptured within 30 seconds of immersion. The oral tube coiled at the oral end as the sperm tube was thrust upward, and finally the sheath ruptured. It seems that the coiling of the oral tube merely adds to the elasticity of the pressure in preparation for the final rupture whereas with fluid pressure alone the rupture would be less violent.

It will be noticed that the oral tube is two-thirds of the total length of the spermatophore in the present species, but contains no "spiral spring" as noted in *Sepioteuthis australis* by Verco and Cotton. In the latter species it is significant that this is only one-fifth of the total length of the spermatophore. From a study of these two, and of other kinds of Cephalopod spermatophores, the following conclusions may be drawn.

1. The action of the spermatophore in ejecting the spermatozoa is mechanical.

2. The function of the oral tube, normally somewhat compressed but more so just previous to rupture, is to induce greater elasticity in the internal pressure of the spermatophore, probably with the object of violently scattering the spermatozoa and avoiding the concentration of them on the rupture of the spermatophore.

3. The immature spermatophore in the Needham's Sac has a considerably smaller sperm tube and proportionately longer false tube than the mature, the overall length of the structure being constant.

4. Where there is an increase in the comparative length of the sperm tube, as in higher forms of Cephalopoda, there is a consequent complication in the ejaculatory apparatus to retain its efficiency.

5. The shape and structure of the mature spermatophore, being non-adaptive, are good specific characters.

NOTE.—The terms oral and aboral, as suggested by Racovitza, are used here, as they are generally accepted.

Explanation of Plates.

PLATE XIX.

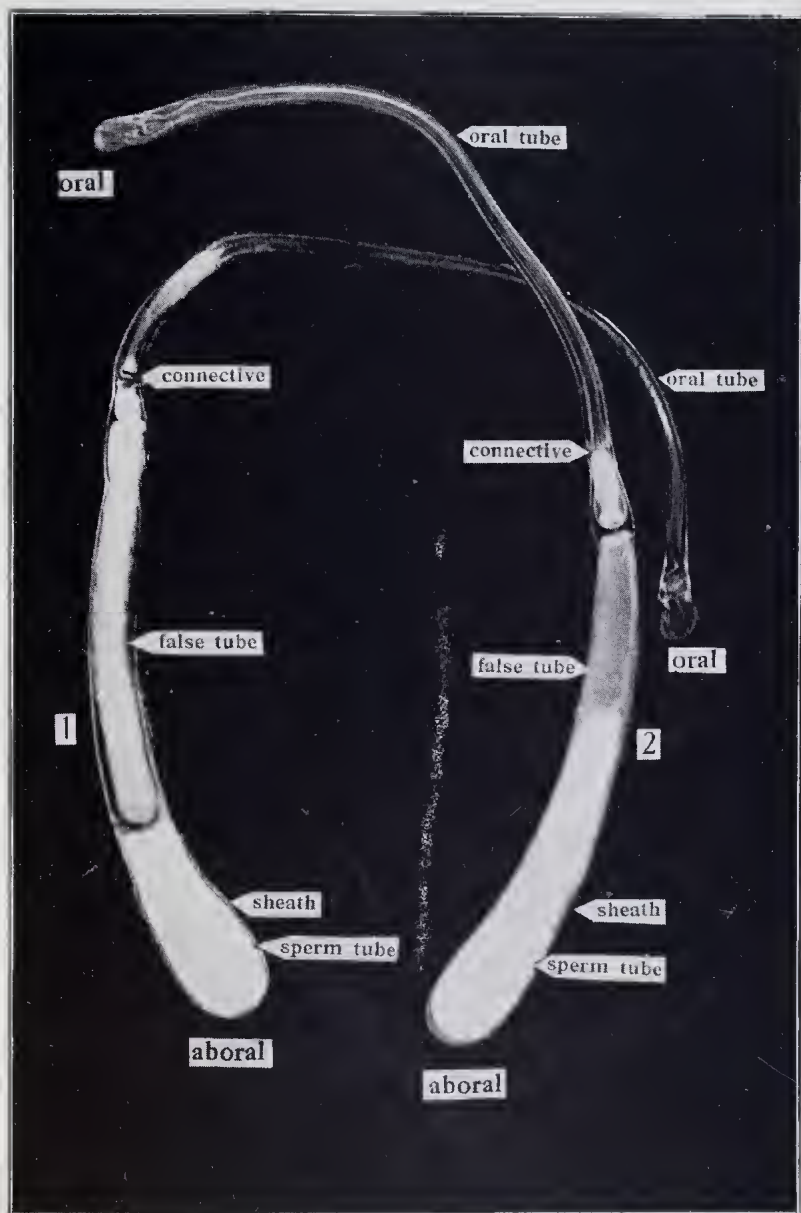
Fig. 1.—The spermatophore of *Rossia australis*, immature. $\times 43$.

Fig. 2.—The spermatophore of *Rossia australis*, mature. $\times 43$.

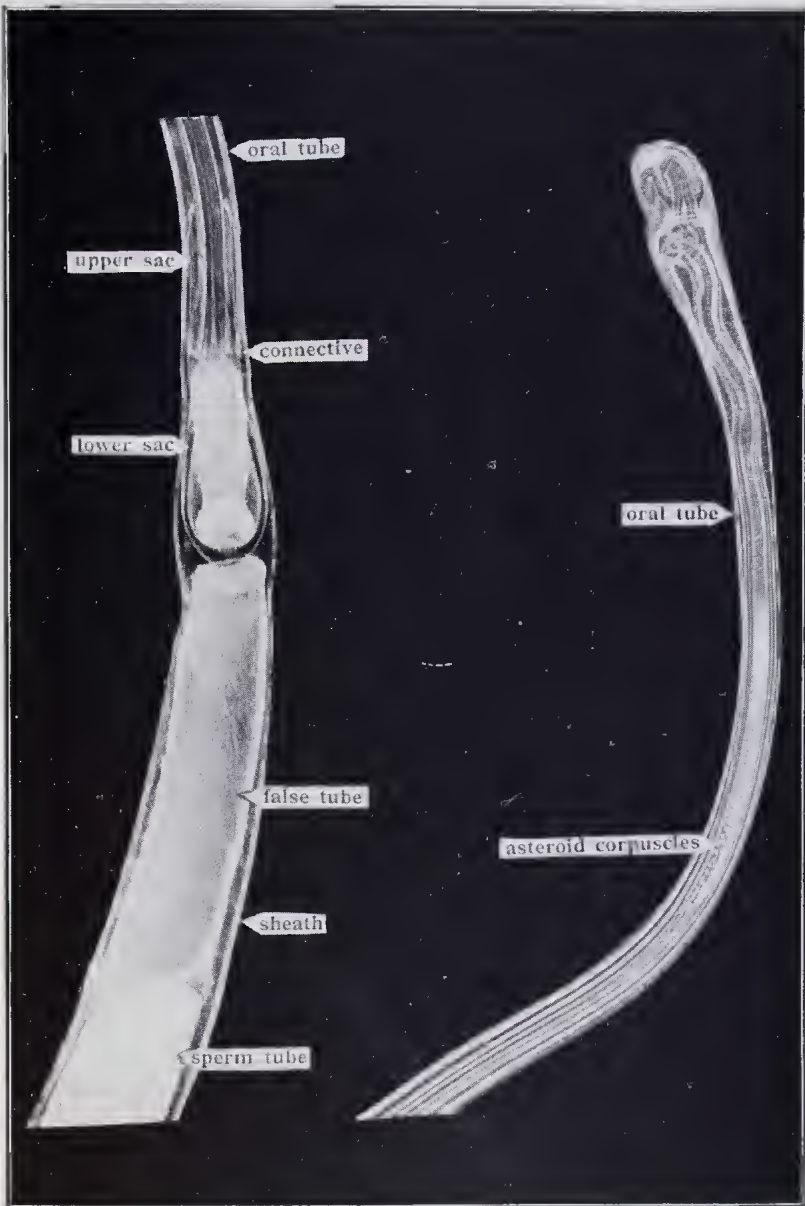
PLATE XX.

Left.—The median portion of the spermatophore of *Rossia australis*.
 $\times 90$.

Right.—The Oral tube of the spermatophore of *Rossia australis*. $\times 90$.



Spermatophore of *Rossia australis*.



Spermatophore of *Rossia australis*.

6. *Sipunculoidea*.

By MARY B. WHEELER.

Genus **Physcosoma** Selenka, 1897.

PHYSCOSOMA SCOLOPS (Selenka and de Man, 1883).

Phascolosoma annulata Hutton, 1880, Trans. N.Z. Inst., xii., p. 278.

Phymosoma scolops Selenka and de Man, 1883, Die Sipunculiden, Semper's Reis. den Philippinen, Wiesbaden, iii., 4, p. 131, Pl. XIV.

Physcosoma annulatum (Hutton), Benham, 1904, Trans. N.Z. Inst., xxxvi., p. 173.

Physcosoma scolops (Selenka and Man), Benham, 1912, *ibid.*, xliv., p. 137.

Benham in 1904 described *Phascolosoma annulata* Hutton as *Physcosoma annulatum*. In 1912 he stated that the same species is identical with Selenka's *P. scolops*, described several years later than Hutton's species. "Hutton's brief diagnosis, depending only on externals, is insufficient for identification, and must give way to Selenka's specific name ———." Hence *P. annulatum* became *P. scolops*.

Selenka (Zool. Anz. 1897, xx., p. 460) substituted *Physcosoma* nom. nov., for *Phymosoma* auct. id. since the latter name was preoccupied.

Several specimens of this species were obtained on Reevesby Island (littoral to 4 fathoms), and it has also been collected from Western Port, Victoria.

The species has been recorded from the Philippine Islands, Singapore, Red Sea, Mozambique, Zanzibar, Kermadec Island, Sunday Island, Meyer Island, New Zealand and Tasmania. If Fischer (Die Gephyrea, Abh. ausd. Geb. Naturwiss., 1895, xiii., p. 10.) is correct in regarding *P. scolops* as a variety of the Mediterranean *P. granulatum*, the range must be extended to include European waters.

7. *Ixodoidea*.

By J. A. TUBB, M.Sc.

Family: ARGASIDAE.

Genus: **Ornithodoros**.

ORNITHODORUS TALAJE var. CAPENSIS Neumann, 1901.

Ornithodoros talaje var. *capensis* Neumann, 1901, Mém. Soc. Zool. de France, xiv., p. 258.

One female was found on English Island. The host was not observed but was probably the Fairy Penguin (*Eudyptula minor*), which frequents this island and which was observed to harbor this tick on Lady Julia Percy Island.

Recorded from Cape Colony, St. Paul's Rocks, Cargados Carajos and Lady Julia Percy Island.

Family: IXODIDAE.

Genus: **Ixodes**.

IXODES PERCAVATUS Neumann, 1906.

Ixodes percavatus Neumann, 1906, Arch. de Parasitologie, xi., p. 200, figs. 4, 5.

A number of engorged females and one nymph were taken from the body of a dead Fairy Penguin (*E. minor*) on Langton Island.

Recorded from Nightingale Island (Tristan d'Acunha Group), and Lady Julia Percy Island.

Genus: **Amblyomma**.Sub-genus: **Aponomma**.

APONOMMA HYDROSAURI (Denny, 1843).

Ixodes hydrosauri Denny, 1843, Ann. Mag. Nat. Hist., xii., p. 314, pl. XVII., fig. 4.*Aponomma hydrosauri* Fielding, 1926, Serv. Publ. Aust., ix., p. 87, fig. 33.

Adults, nymphs, and larvae of this species were found parasitic on *Trachysaurus rugosus* Gray, and *Notechis scutatis* var. *niger* Kinghorn.

In the original description of the species, Denny states that the host from which his specimens were taken was the "Guana (probably the *Hydrosaurus Gouldii* of Mr. Gray)." The "Guana" or "Goanna" of Tasmania is not a varanid, but a *Tiliqua*, either *T. nigrolutea* or *T. scincoides*, and the confusion of colloquial names must be blamed for the error in the designation of the host of this tick as *Varanus gouldii* (Gray).

The writer has found this parasite on *Tiliqua nigrolutea* (Gray) captured at Mornington (Victoria) and on the same species captured at Fern Tree Gully (Victoria).

Previously recorded from Tasmania.

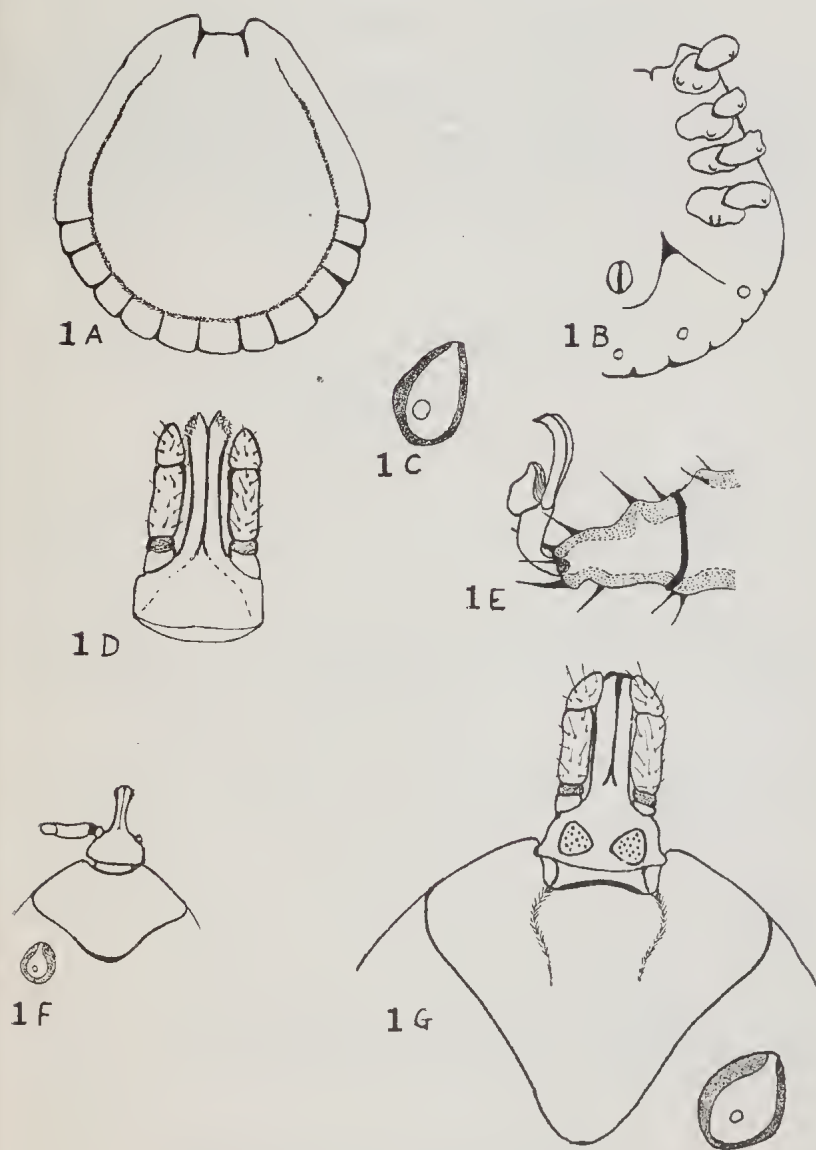


FIG. 1.—*Aponomma hydrosauri*.—a-e, Male, a, dorsum, x 10; b, venter, x 10; c, spiracle, x 17; d, capitulum, x 20; e, tarsus I, x 40; f, Nymph, dorsum and spiracle, x 17; g, female, dorsum and spiracle, x 17.

8. *Decapoda*.

By BERYL H. ANDERSON, B.Sc.

Twenty-one genera and twenty-three species were collected, all species having been previously listed for South Australian waters by Hale (Crustaceans of South Australia, 1927-29). The only details submitted in the following list are those relating to sex, locality and points of description differing from those given by previous authors. Only the most significant references to synonymy are given.

Order: DECAPODA.

Sub-Order: BRACHYURA.

Family: DROMIIDAE.

PETALOMERA LATERALIS (Gray, 1831).

Dromia lateralis Gray, Zool. Misc., 1831, p. 40.

Cryptodromia lateralis (Gray), Stimpson, Proc. Acad. Nat. Sci. Phil., x., 1858, p. 226.

Petalomera lateralis (Gray), Borradaile, Ann. Mag. Nat. Hist. (7), xi., 1903, p. 301.

A female was collected on a reef off the sand spit on the west coast of Reevesby Island. The specimen carried on its back a colonial Ascidian, and was completely obscured from above.

CRYPTODROMIA OCTODENTATA (Haswell, 1881).

Dromia octodentata Haswell, Proc. Linn. Soc. N.S.W., vii., 1881 p. 755.

Cryptodromia octodentata (Haswell), Rathbun, Sci. Res. "Endeavour," v., iii., 1923, p. 151, pl. xli.

A male carrying a large sponge was taken on the west coast of Reevesby Island and a female from a *Posidonia* bank off Lushy Island.

DROMIDIOPSIS EXCAVATA (Stimpson, 1858).

Dromidia excavata Stimpson, loc. cit., 1858, p. 239.

Dromidiopsis excavata (Stimpson), Rathbun, loc. cit., 1923, p. 146. pl. xxxviii.

A female was collected from the north end of Reevesby Island.

Family: HYMENOSTOMATIDAE.

HALICARCINUS OVATUS Stimpson, 1858.

Halicarcinus ovatus Stimpson, loc. cit., 1858, p. 109.

Numerous specimens of both sexes were collected from rocks around Reevesby Island.

Family: MAJIDAE.

SCHIZOPHRYS ASPERA (Milne-Edwards, 1834).

Mithrax aspera Milne-Edwards, Hist. Nat. Crust., i., 1834, p. 320.

Schizophrys aspera (Milne-Edwards), Alcock, Journ. Asiat. Soc. Bengal., lxiv., 1895, p. 243.

Five males of this species were collected in rock pools on the west coast of Reevesby Island.

Family: PORTUNIDAE.

OVALIPES PUNCTATUS (de Haan, 1833).

Corystes (Anisopus) punctata de Haan, Faun. Japon., Crust., 1833, p. 13.

Ovalipes punctatus (de Haan), Rathbun, U.S. Nat. Mus. Bull., clii., 1930, p. 24, pls. v-viii.

Platyonichus bipustulatus Milne-Edwards, loc. cit., 1834, p. 437, pl. xvii., figs. vii-x.

Ovalipes bipustulatus (Milne-Edwards), Rathbun, Proc. U.S. Nat. Mus., xxi., 1898, p. 597.

This species was common in shallow water along the coast of Reevesby Island. A number were taken in the fishing net.

NECTOCARCINUS INTEGRIFRONS (Latreille, 1825).

Portunus integrifrons Latreille, Encycl. x., 1825, p. 192.

Nectocarcinus integrifrons (Latreille), Milne-Edwards, Ann. Sci. Nat. (4), xiv., 1860, p. 220.

Three specimens were taken. A male and a female were found in the fish net on the west coast of Reevesby Island and a male was dredged at a depth of five fathoms between Reevesby and Marum Islands.

Family: XANTHIDAE.

OZIUS TRUNCATUS Milne-Edwards, 1834.

Ozius truncatus Milne-Edwards, loc. cit., 1834, p. 406, pl. xvi., fig. xi.

Two females were obtained from the west coast of Reevesby Island.

Family: PINNOTHERIDAE.

PINNOTHERES SUBGLOBOSA Baker, 1907.

Pinnotheres subglobosa Baker, Trans. Roy. Soc. S. Aust., xxxi., 1907, p. 179.

Numbers of these were obtained from mussel shells. All the specimens were females.

Family: GRAPSIDAE.

LEPTOGRAPSUS VARIEGATUS (Fabricius, 1793).

Cancer variegatus Fabricius, Ent. Syst., iii., 1793, p. 450.

Leptograpsus variegatus (Fabricius), Milne-Edwards, Ann. Sci. Nat. (3), xx., 1853, p. 171.

A female specimen showing red and yellow coloration was taken under rocks on the north coast of Reevesby Island.

BRACHYNOTUS OCTODENTATUS (Milne-Edwards, 1837).

Cyclograpsus octodentatus Milne-Edwards, Hist. Nat. Crust., ii., 1837, p. 80.

Brachynotus octodentatus (Milne-Edwards), Hale, Crust. S. Aust., 1929, p. 182.

A male specimen was collected on the rocks in Moreton Bay.

PLAGUSIA CHABRUS (Linnaeus, 1766).

Cancer chabrus Linnaeus, Syst. Nat., 1766, p. 1044.

Plagusia chabrus (Linnaeus), White, Ann. Mag. Nat. Hist., xvii., 1846, p. 497.

A number of specimens were taken from rock pools at the north end of Reevesby Island.

Family: LEUCOSIIDAE.

PHILYRA LAEVIS Bell, 1855.

Philyra laevis Bell, Trans. Linn. Soc., xxi., 1855, p. 300, pl. xxxii., fig. vii.

Two males and one female were collected off the reef on the west coast of Reevesby Island.

Sub-Order: ANOMURA.

Family: GALATHEIDAE.

GALATHEA AUSTRALIENSIS Stimpson, 1858.

Galathea australiensis Stimpson, loc. cit., 1858, p. 251.

A number of specimens were dredged at a depth of four fathoms between Lusby and Partney Islands, and also in Moreton Bay. In living specimens the fingers of the chelae were bright crimson and the rest of the body pale yellow.

Family: PAGURIDAE.

PAGURISTES FRONTALIS (Milne-Edwards, 1836).

Pagurus frontalis Milne-Edwards, Ann. Sci. Nat. (2), vi., 1836, p. 283, pl. xiii., fig. iii.

Paguristes frontalis (Milne-Edwards), Alcock, Cat. Ind. Decap. Crust., ii., 1905, p. 155.

Four females and two males were collected between Marum and Reevesby Islands and in rock pools on the west coast of Reevesby Island. All the females were larger than the males and carried a large brood pouch formed by a thin flap on the side of the abdomen. They were obtained from the following shells—*Amoria undulata* (Lamarck), *Xenophalium* sp., *Polinices conicus* (Lamarck), *Lyria* sp.

PAGURISTES BREVIROSTRIS, Baker, 1905.

Paguristes brevirostris Baker, Trans. Roy. Soc. S. Aust., xxix., 1905, p. 256, pl. xxxiii., figs. i., ia.

A female was obtained from a shell of *Nerita melanotragus* (E. A. Smith) dredged between Reevesby and Lusby Islands.

Family: LITHODIDAE.

LOMIS HIRTA (Lamarck, 1816).

Porcellana hirta Lamarck, Hist. Anim. s. Vert., v., 1816, p. 229.

Lomis hirta (Lamarck), Milne-Edwards, loc. cit., 1837, p. 188.

This species was common on rocks around Reevesby Island.

Sub-Order: MACRURA.

Family: PALAEMONIDAE.

LEANDER INTERMEDIUS Stimpson, 1858.

Leander intermedius Stimpson, Proc. Acad. Nat. Sci. Phil., xii., 1860, p. 41.

This species was very common at a depth of two and a half fathoms on a *Posidonia* bank between Reevesby and Lusby Islands, and also off Spilsby at a depth of seven to nine fathoms.

LEANDER SERENUS Heller, 1865.

Leander serenus Heller, Reise der Novara., Crustacea, 1865, p. 110, pl. x., fig. v.

Specimens were readily collected in rock pools surrounding Reevesby Island.

Family CRAGONIDAE.

PONTOPHILUS INTERMEDIUS (Bate, 1863).

Crangon intermedius Bate, Proc. Zool. Soc., 1863, p. 503, pl. xli., fig. vi.

Pontophilus intermedius (Bate), Hale, loc. cit., 1929, p. 62.

One specimen was dredged at a depth of eight fathoms off Spilsby Island.

Family: SYNALPHEIDAE.

CRANGON VILLOSUS (Olivier, 1811).

Palaemon villosus Olivier, Encycl., Hist. Nat. Insectes., v., 1811, p. 664.

Crangon villosus (Olivier), Hale, *loc. cit.*, 1929, p. 46.

A number of specimens were dredged at a depth of four to five fathoms in Moreton Bay, and between Lusby and Partney Islands. In spirit specimens the large chelae showed blue coloration.

CRANGON EDWARDSI (Audouin, 1809).

Athanasus edwardsi Audouin, Explic. planches de Savigny, Descr. de l'Egypte, Atlas, 1809, pl. x., fig. i.

Crangon edwardsi (Audouin), Hale, *loc. cit.*, 1929, p. 47.

A number of specimens was collected at a depth of four fathoms between Lusby and Partney Islands. After remaining in spirit for some time the last third of the large chelae showed green and purple coloration.

Family: PENEIDAE.

PENEUS LATUSULCATUS Kishinouye, 1900.

Peneus latusulcatus Kishinouye, Journ. Fish. Bureaux, Tokyo, viii., 1, 1900, p. 12, pl. ii., fig. ii., pl. vii., fig. iia.

Specimens were commonly caught in the fish net at the south end of Reevesby Island.

Family: PALINURIDAE.

JASUS LALANDII (Milne-Edwards, 1837).

Palinurus lalandii Milne-Edwards, *loc. cit.*, 1837, p. 293.

Jasus lalandii (Milne-Edwards), Parker, N.Z. Journ. Sci., i., 1883, p. 584.

One specimen was found washed up on the beach on the east coast of Reevesby Island.

9. Isoptera.

By GERALD F. HILL, Senior Research Officer, Division of Economic Entomology, Canberra.

The collection of termites comprises four species, all of which occur on Kangaroo Island, and are widely distributed on the mainland.

Family: CALOTERMITIDAE.

Genus **Calotermes** (Hagen) Holmgren.

Sub-genus **Calotermes** (Hagen) Holmgren.

CALOTERMES (CALOTERMES) CONDONENSIS Hill.

Calotermes (Calotermes) condonensis Hill, 1922, Proc. Linn. Soc. N. S. Wales, xlvii., p. 275, text-figs. 1-4.

Calotermes (Calotermes) oldfieldi Hill, 1925, Proc. Roy. Soc. Vict., xxxviii., p. 207, pl. xxiii., figs. 1, 2.

This species, the only representative of the sub-genus known from Australia, was described from Condon, Western Australia. *C. oldfieldi* was described from winged adults and soldiers from Kiata, Victoria. An examination of complete series from Reevesby Island (J. Clark, December, 1936), and from Kangaroo Island (Wynis Kent Hughes, November, 1931) establishes the above synonymy. It is a very variable species in both castes in all the characters ordinarily used in descriptions. A small form, *C. condonensis* var. *chryseus* Hill occurs commonly in eastern New South Wales.

Distribution.—The typical form occurs in the following localities:—Western Australia: Condon, Ludlow; South Australia: Reevesby Island, Kangaroo Island; Victoria: Kiata, Bamawm, Frankston; New South Wales: Eden; Queensland: Dalby.

Biology.—All species of the family *Calotermitidae* live exclusively in wood excepting for a brief period when the recently developed winged males and females leave the parent colony for the purpose of founding new colonies. *C. condonensis* is usually found in dead branches or branch stubs, and in the adjacent truewood of living trees. There is a recent record from Victoria of the occurrence of a colony in the butt of a power pole. On Reevesby Island, where this species is abundant, most of the colonies were found in fallen trees of *Myoporum insulare* R. Br.

Family: RHINOTERMITIDAE.

Genus **Heterotermes** (Froggatt).**HETEROTERMES FEROX** (Froggatt).

Termes ferox Froggatt, 1897, Proc. Linn. Soc. N. S. Wales, xxii, p. 724, pl. xxxiv., figs. 1, 1A, 1B.

Described from specimens collected near Sydney, this species is now known to have a wide distribution in southern Australia. The soldiers and workers of several species are difficult to classify satisfactorily in the absence of winged adults. The Reevesby Island material (workers and soldiers only) agrees with authenticated specimens from New South Wales and Kangaroo Island. It is of interest to note that the last-mentioned island is the type locality of the genotype, *H. platycephalus* Froggatt, which occurs also in Western Australia.

Distribution.—New South Wales, Victoria, South Australia, and possibly Western Australia.

Biology.—This species, like others of the genus, is subterranean in its nesting habits. The colonies are small, and usually are found attacking decaying wood. Imported softwoods are very susceptible to attack. In some localities soldiers and workers, and occasionally winged adults also, are found in flattened galleries under stones, and at the margin of mounds of the common "meat-ant" (*Iridomyrmex detectus* Sm.). These galleries extend deeply into the ground, and doubtless communicate with the nest, which has not been described. The Reevesby Island specimens (coll. J. Clark) were found in a branch of a dead tree.

Family: TERMITIDAE.

Genus **Eutermes** Fritz Muller.**EUTERMES EXITIOSUS** Hill.

Eutermes exitiosus Hill, 1925, Proc. Roy. Soc. Vict., xxxvii., p. 222, pl. xxv., figs. 30-35.

This species was described from Western Australia, and has since been recorded from many localities in southern Australia.

Distribution.—Southern districts of Western Australia and South Australia, Victoria (excepting Gippsland and Otway districts), and New South Wales (excepting on the summit of the highest mountain ranges).

Biology.—It is a mound-building, wood-eating species of very considerable economic importance in the destruction of seasoned timber. Certain phases of its biology have been studied intensively by the Council for Scientific and Industrial Research, by whom it is being used in the laboratory and under natural conditions in the field for the purpose of testing the termite-resisting properties of timbers, timber-preserved and other materials. Several small mounds were found on Reevesby Island, the largest of which was in a stump of *Casuarina distyla* Vent.

Genus **Hamitermes** Silvestri.

HAMITERMES NEOGERMANUS Hill.

Hamitermes neogermanus Hill, 1921, Bull. Ent. Res., xii, p. 390, text-fig. 22.

This species was described from Mount Lofty Ranges, South Australia, and is known to occur in many places in southern Australia.

Distribution.—Southern districts of Western Australia and South Australia (including Kangaroo Island); Victoria and New South Wales (in the drier grassland areas).

Biology.—The genus is widely distributed throughout the Australian mainland, and is represented by about 35 described species with very diverse feeding and nesting habits. A few wood-eating species are of economic importance. Many species feed on grass and vegetable debris, which they gather into mounds or into subterranean galleries. Several grass-eating, mound-building species build small to very large mounds on certain northern aerodromes, and thus render these landing places unsafe for the purpose for which they are intended. The well-known "meridional" or "compass" mounds of North Australia are constructed by a species of this genus (*H. meridionalis* (Froggatt)). *H. neogermanus* lives in subterranean galleries and appears to feed only on grass and grass-debris.

10. *Formicidae* (*Hymenoptera*).

By JOHN CLARK, Entomologist, National Museum of Victoria.

The collecting was confined almost entirely to Reevesby Island. The ant fauna is typical of South and Western Australia, and it is interesting to note that Reevesby Island, 3 miles long by 1 mile wide, contains almost twice the number of species of ants found in the British Isles or in New Zealand. Both these countries have about twenty species each. Thirty-three species, in twenty genera, representing four sub-families, were obtained on Reevesby Island, seven of these were found also on Winceby Island and two on English Island. Four of the species belong to genera not recorded previously from South Australia. One species is known only from South Australia, two only from Western Australia, nine from the dry inland area of Western Australia, South Australia, and Victoria, and seven are common in most parts of all the States; only four of the total number have been found in Tasmania. Fourteen species are new; one of these is found also on the mainland and extends westward to Balladonia. The hot weather and dry conditions on the island were not favourable for ant life. Most of the species were found in their nests under the shelter of small shrubs, whilst a few had their nests beneath the leaf debris under the large shrubs and some of the sun-loving species were nesting in the open, clear of all shade. Most of the *Myrmicinae* and *Formicinae* were found in rotten trunks and stumps of the "Native juniper" or "Boobialla", the nest of some species being of considerable size.

The *Ponerinae*, or stinging ants, are represented by seven species in six genera. Of these *Rhytidoponera punctata* (Smith) is the most common species, their small crater-like mounds being abundant. Numerous nests of the slender bull ant *Myrmecia gracilis* Emery were found near the middle of the island, particularly near the camp. Several small nests of the interesting genus *Eubothroponera*, were found beneath the accumulated debris under large shrubs near the middle of the island. In the same situations also were found nests of a jumping bull ant *Myrmecia* (*Promyrmecia*) *dichospila* sp. n. described herein and *Euponera* (*Brachyponera*) *nigra* Clark a black species found in various parts of Western Australia. The common "green head ant" *Chalcopyponera metallica* Smith is abundant; it is found throughout the Commonwealth. *Myrmecia*, *Eubothroponera*, and *Chalcopyponera* are purely Australian genera; *Rhytidoponera* is a Papuan genus and *Acanthoponera* is found in New Zealand and South America.

The sub-family *Myrmicinae* is represented by ten species in eight genera. Nests of *Crematogaster* and *Dacryon* were found in fallen rotten trunks of "Native juniper", and in several instances the trunks were occupied also by the large termite

Calotermes condonensis Hill. The only arboreal species found is the common "tree ant" *Podomyrma adelaidae* (Smith); it is widely distributed on the mainland.

The sub-family Dolichoderinae is represented by seven species in two genera. Several large nests of the "meat-ant" *Iridomyrmex detectus* Smith were found. This is the most common and widely distributed ant in Australia. The blue or greenish-blue variety of this species is common at the north end of Reevesby Island. Described originally from Killalpaninna, South Australia, it extends westward to Balladonia. The nests of the variety are inconspicuous and indicated by small entrance tunnels without traces of a mound. The mounds of *I. detectus* generally are several feet in diameter and almost 2 feet high.

The sub-family Formicinae is represented by nine species in five genera. Four of the species are new, the remainder are widely distributed in Australia.

Family FORMICIDAE Latreille, 1810.

Sub-family PONERINAE Lepeletier.

Genus **Myrmecia** Fabricius.

MYRMECIA GRACILIS Emery.

M. gracilis Emery, Ren. Accad. Sc. Bologna, p. 232, fig. 2, 1898, ♂.

M. crudelis Sm. var. *gracilis* Emery, Gen. Insect., fasc. 118. p. 19, 1911, ♂.

(Fig. 1.)

Worker.—Length 20–22 mm.

Head and gaster black, thorax, node and postpetiole ferruginous, mandibles yellow, clypeus, antennae and tarsi reddish yellow, femora and tibiae brownish.

Hair yellow, abundant, slender and erect on head and thorax, sub-erect on legs, none on scapes, very long on gaster. Pubescence greyish, very abundant and adpressed, particularly on gaster.

Mandibles shining, feebly punctate-striate. Head coarsely and irregularly rugose, finely and densely reticulate between the rugae. Pronotum transversely arched striate, mesonotum and epinotum transversely striate. Node punctate-rugose, rugae obsolete. Postpetiole, gaster and legs microscopically punctate.

Head as long as broad, strongly rounded behind, occiput not truncate. Mandibles as long as head, linear and parallel, external border concave in middle. Clypeus broadly and deeply excised in middle, borders convex, anterior angles sharp pointed. Labrum broader than long, projecting in front of clypeus, anterior border broadly convex. Frontal carinae twice as long as broad in front, parallel. Frontal area large and triangular. Scares extend beyond

occipital border by one-third their length. Second segment of funiculus one and one-half times longer than first, third very slightly longer than first, remainder sub-equal to apical. Eyes large and convex. Ocelli small and close together. Thorax three times longer than broad. Pronotum as long as broad, strongly convex in all directions. Mesonotum circular, as long as broad, convex above. Metanotum deep and wide, one-third as long as mesonotum. Epinotum slightly longer than broad, strongly rounded in all directions. In profile pronotum strongly convex from base to apex. Mesonotum strongly convex, much higher than pronotum, higher in front than behind. Metanotum deep and long. Epinotum feebly convex, strongly rounded into declivity. Node circular, as long as broad, convex on top, one-fourth longer than stalk in front. In profile dome-shaped, anterior face concave below, the spine in front below very short and blunt. Postpetiole one-third broader than long, two-thirds broader behind than in front, sides feebly convex. Gaster slightly longer than broad. First segment one-sixth broader than long, broader behind than in front, sides strongly convex. Legs long and slender.

Female.—Length 24.5–26 mm.

Similar to worker, but more robust. Colour darker and sculpture coarser. Head almost square and more truncate behind. Mayrian and parapsidal furrows strongly impressed on scutellum. A deep narrow impression between metanotum and epinotum. Legs more robust. Wings missing.

Male.—Length 18–19 mm.

Colour and pilosity as in the worker. Sculpture finer, more punctate-reticulate, the punctures large and shallow.

Head, across the eyes, one-fourth broader than long, strongly convex behind. Mandibles short, triangular, edentate. Clypeus flatly convex above, feebly indented in middle in front. Frontal carinae short and elevated. Frontal area small. Scape one-third longer than first segment of funiculus, second segment three and one-half times longer than scape, third, fourth, and fifth equal in length, one-third shorter than second, remainder sub-equal to apical. Eyes large, occupying almost one-half of sides. Ocelli large and convex. Thorax barely twice as long as broad. Pronotum short, strongly convex in front. Scutellum broader than long, bluntly cone-shaped in front, mayrian and parapsidal furrows deeply impressed, a fine short longitudinal groove in front. Mesonotum slightly broader than long, anterior edge straight, sides feebly, posterior border strongly convex. Epinotum short, strongly convex transversely. Node as long as broad, circular, longer than stalk in front, in profile dome-shaped, evenly convex, the ventral spine very short and blunt. Postpetiole very slightly broader than long, fully two and one-half times broader

behind than in front, sides straight to posterior fourth then strongly convex. Gaster fully one-fourth longer than broad. First segment one-fourth broader than long, sides strongly convex. Pygidium retracted. Legs long and slender. Wings hyaline.

Habitat.—Reevesby Island.

Numerous nests of this species were found, particularly near the middle of the island, and around the camp. All the nests are the usual crater-shaped mounds about ten inches high. Several nests were dug out; all were 2 feet deep and contained about 200 workers. Although described as a species by Emery he later regarded it as a variety of *M. crudelis* Smith. It is related to *M. vindex* Smith not to *M. crudelis* as supposed by Emery; *M. crudelis* was unknown to him. *M. gracilis* was described from a single, damaged specimen from Kangaroo Island and has not been recorded since. It is abundant and widespread in South Australia, parts of Western Australia and Victoria.

Sub-genus **Promyrmecia** Emery.

MYRMECIA (PROMYRMECIA) DICHOSPILA sp. n.

(Fig. 2.)

Worker.—Length 7-9 mm.

Black, dorsum of node and a large spot on epinotum red. Mandibles yellow at base, reddish yellow towards apex, teeth brown. Labrum reddish yellow. Scapes brown, funiculi reddish yellow. Tarsi and apex of tibiae brownish yellow.

Mandibles finely striate-reticulate with a row of large deep punctures along the inner borders. Head finely striate-rugose longitudinally, densely and finely reticulate between the rugae. Clypeus and frontal area finely and densely reticulate, not striate. Pronotum striate-rugose, transversely arched. Mesonotum striate-rugose longitudinally. Epinotum and node coarsely and irregularly rugose. Postpetiole and gaster very finely reticulate.

Hair yellowish, long and erect, particularly on clypeus and last three segments of gaster. None on antennae, very short and sparse on legs. Pubescence greyish, very fine and adpressed, longer and more abundant on gaster.

Head as long as broad, sides and occipital border straight, angles broadly rounded. Mandibles one-fifth shorter than head, external border concave, inner border strongly dentate, the third, fifth, seventh, and ninth teeth twice as large as the others, the ninth forming a slight angle. Clypeus deeply excised in middle in front. Labrum convex in front. Frontal area large and deep, semi-circular. Frontal carinae swerving behind, twice as long as wide in front. Scapes not extending to occipital border by twice

their thickness at apex. First and second segment of funiculus equal length, third one-fourth shorter. Eyes large, occupying half the length of sides. Ocelli small. Thorax two and one-half times longer than broad. Pronotum one-third broader than long, strongly convex in all directions. Mesonotum circular, as long as broad. Epinotum slightly longer than broad, strongly convex transversely. In profile pronotum strongly convex from apex to base. Mesonotum higher than pronotum, dropping behind, strongly convex. Epinotum feebly convex on dorsum, strongly rounded into and united with declivity. Node slightly broader than long, fully twice as long as the stalk in front, convex in all directions. In profile slightly higher than long, apical third straight and vertical, sloping gradually to apex of stalk in front, dorsum convex, rounded into posterior face, ventral spine long and broad, sharp pointed, directed forward. Postpetiole almost one-third broader than long, broadest at middle, strongly convex in all directions; constriction deep and wide. Gaster one and two-thirds times longer than broad. First segment of gaster one-fifth broader than long, much broader behind than in front, sides convex. Legs long and slender.

Female.—Length 11 mm.

Colour, sculpture and pilosity similar to worker. Mandibles broader and straighter, teeth larger. Pronotum twice as broad as long, one-third shorter than scutellum, convex in all directions. Scutellum short, one-fourth broader than long, sides and front semi-circular, convex both ways on top. Parapsidal furrows distinct. Wing stumps present. Mesonotum circular, as long as broad, dome-shaped above. Epinotum feebly convex transversely. Node one-fifth broader than long. Postpetiole almost twice as broad as long. Legs slender.

Male.—Length 9.5 mm.

Head and gaster black. Thorax, node, postpetiole and legs brownish yellow, mandibles and scapes brown, funiculi yellowish red.

Head finely punctate-reticulate, more coarsely punctate behind. Thorax and node finely and densely reticulate, with numerous large shallow punctures scattered throughout, coarser and more abundant on epinotum. Postpetiole and gaster finely and densely reticulate. Pilosity as in worker but the erect hairs longer.

Head almost one-third broader than long, strongly convex behind. Mandibles short, furnished with four strong sharp teeth. Clypeus broad, convex above, concave in middle in front. Frontal area large, triangular. Frontal carinae one-third longer than broad in front. Scapes two and one-half times longer than first segment of funiculus, second segment six times longer than first, remainder sub-equal to apical. Eyes large, occupying almost all the sides. Ocelli large. Thorax two and one-half times longer than broad.

Pronotum short, strongly convex. Scutellum one-fifth broader than long, convex in front, median and parapsidal furrows and frontal groove in centre deeply impressed. Mesonotum one-third broader than long, anterior edge feebly convex, sides and posterior edge strongly convex. Epinotum strongly convex transversely. Node circular, as long as broad, fully four times as long as the stalk in front, in profile like node of worker but ventral spine straight. Postpetiole as long as broad, almost three and one-half times broader behind than in front, sides straight to basal third then strongly convex. Gaster fully twice as long as broad. First segment almost one-third broader than long, much broader behind than in front. Genitalia retracted. Legs long and slender. Wings hyaline.

Habitat.—Reevesby Island.

One nest and numerous workers were found. The male was obtained by Mr. Croll at a light late in January. This species is related more closely to *P. urcus* Lowne than to any other known species. The workers vary slightly in size and colour. The smallest workers have epinotum and node black; these are red in the majority of workers.

Genus **Eubothroponera** Clark.

EUBOTHROPONERA BRUNNIPES sp. n.

(Fig. 3.)

Worker.—Length 5 mm.

Castaneous. Mandibles, antennae and legs brown, posterior margin of node black.

Very finely and densely reticulate throughout, with some shallow obsolete punctures. Node coarsely punctate, more rugose.

Hair reddish, sub-erect and abundant, shorter on scapes and legs. Pubescence greyish, abundant and adpressed throughout.

Head one-sixth longer than broad, sides strongly, occipital border feebly convex, angles rounded. Mandibles triangular, abruptly bent at their bases, anterior edge of masticatory border sharp, edentate on the apical half and four or five obsolete teeth behind. Clypeus strongly convex in all directions. Frontal carinae flat, lobe-like, overhanging the antennal insertions in front. Scares extend beyond occipital border by fully their thickness, second and third segments of funiculus equal length, one-fourth shorter than first, apical bluntly pointed, twice as long as the preceding. Eyes convex, placed in front of the middle of the sides. Thorax barely twice as long as broad. Pronotum almost one-third broader than long, convex in all directions. Promesonotal suture deeply impressed. Meso-ePINOTUM one-fourth longer than broad, strongly convex transversely, posterior border

feebly margined. In profile convex longitudinally, pro-mesonotal suture deeply impressed, pronotum dropping abruptly in front, epinotal declivity at an obtuse angle, sides and top feebly margined. Node almost one-third broader than long, front and sides strongly convex, posterior border sharply margined, feebly concave, with a slight tubercle-like projection in the middle; in profile one-fourth higher than long, anterior face and dorsum convex, posterior face concave, feebly margined, ventral surface concave, with indications of a feeble spine behind. Postpetiole one-fourth broader than long, sides straight, parallel, anterior angles broadly rounded, a deep constriction between postpetiole and gaster. First segment of gaster slightly broader than long, sides convex. Legs short and robust.

Habitat.—Reevesby Island.

Euponera sub-genus **Brachyponera** Emery.

EUPONERA (BRACHYPONERA) RUFONIGRA Clark.

Euponera (Brachyponera) rufonigra Clark, Mem. Nat. Mus. Vict., Melbourne, viii., p. 30, pl. vi., figs. 12-13, 1934, ♂ ♀.

Several small nests of this species were found throughout Reevesby Island. The nests were never more than 4 inches deep in the soil amongst leaf debris under bushes. No nest contained more than one dozen individuals.

There are no differences on which to separate this from the Western Australian form. It has a wide range along the South-Western coast.

Genus **Acanthoponera** Mayr.

ACANTHOPONERA IMBELLIS Emery

Acanthoponera imbellis Emery, Ann. Soc. Ent. Belg., xxxix., p. 346, 1895, ♂.

Two nests of this species were found, both in rotten tree stumps in the ground, on Reevesby Island. A single worker was found under a stone on Winceby Island. Originally described from Queensland, this species has been recorded previously from Adelaide.

Genus **Chalcoponera** Emery.

CHALCOPONERA METALLICA (Smith).

Ponera metallica Smith, Cat. Hymn. Brit. Mus., vi., p. 94, pl. vi., figs. 17, 18, 1858, ♂ ♀.

First recorded from Adelaide, this species is widely distributed throughout Australia. It was abundant on Reevesby Island.

Genus **Rhytidoponera** Mayr.

RHYTIDOPONERA PUNCTATA (Smith).

Ectatomma punctata Sm., Cat. Hymn. Brit. Mus., vi., p. 104, 1858, ♂.

Rhytidoponera punctata Clark, Mem. Nat. Mus. Vict., ix, p. 57, pl. 5, fig. 34, 1936, ♂.

Previously known only from Port Lincoln, this species was most abundant on Reevesby Island. The nest is typical of this group, a crater-shaped mound with the entrance covered with leaves and twigs. Several males were obtained from nests. They have not been described previously.

Male.—Length 9–10 mm.

Blackish brown, mandibles, antennae and legs reddish brown. Wings hyaline with a slight brownish tinge.

Mandibles finely and densely reticulate, with some obsolete striae near base. Head and thorax with scattered large shallow punctures, finely and densely reticulate between the punctures. Node and gaster microscopically punctate and with more scattered obsolete punctures.

Hair reddish, sparse, short and erect, longer on apical segments of gaster, very short and adpressed on antennae and legs. No pubescence.

Head as long as broad, strongly arched behind eyes. Mandibles triangular, with numerous fine sharp teeth. Clypeus broad, flatly convex above, sharply convex in front. Frontal carinae as long as broad in front, swerving outward behind. Second and third segments of funiculus equal length, one-fourth longer than scape, first segment one-fourth of length of scape. Eyes placed at middle of sides. Ocelli large. Thorax barely twice as long as broad. Pronotum hardly seen from above. Scutellum slightly broader than long, strongly convex in front and above, mayrian furrows wide and deep in front, obsolete behind, parapsidal furrows sharply impressed. Mesonotum one-fifth broader than long, anterior edge straight, sides and posterior edge convex. Epinotum strongly convex transversely. In profile pronotum short and erect, convex. Scutellum erect in front, convex from apex to base, almost hemispherical. Mesonotum dome-shaped, longer than high. Epinotum convex from base to foot of declivity. Node stalk-like, one-fifth longer than broad behind, sides almost parallel; in profile twice as long as high, slightly higher behind than in front. Postpetiole as long as broad, pear-shaped, sides convex behind, constriction deep and wide. First segment of gaster much broader than long, sides convex. Genitalia retracted. Legs long and slender.

Habitat.—Reevesby Island, Winceby Island.

Sub-family MYRMICINAE Lepel, 1836

Genus **Dacryon** Forel.**DACRYON NITIDA** sp. n.

(Fig. 4.)

Worker.—Length 3.5–4.5 mm.

Head, thorax and nodes brown, gaster black, mandibles and antennae yellow.

Shining. Mandibles finely striate longitudinally. Head with five sharp longitudinal striae between antennal grooves. Thorax almost smooth, with some traces of fine longitudinal striae. Node with two longitudinal carinae on top. Postpetiole with six or seven strong longitudinal striae. First segment of gaster finely and densely striate longitudinally at base, remainder of gaster smooth and shining.

Hair yellow, long and erect on head, scapes and apical segments of gaster, very sparse elsewhere. Pubescence grey, very short and adpressed on gaster, longer on funiculi, not apparent on rest of body.

Head slightly longer than broad, sides and occipital border feebly convex, angles rounded. Mandibles triangular, with five or six large sharp teeth. Clypeus convex above and in front, with a feeble indentation in the middle of anterior edge. Antennal grooves deep and wide, edges sharply margined, extending backward almost to occipital border. Scapes not extending to occipital border by fully their thickness. First segment of funiculus as long as the second and third together. Eyes small, placed at middle of sides. Thorax, to end of spines, barely twice as long as broad. Pro-mesonotum as long as broad, sharply margined in front and sides, anterior border convex in middle, angles sharp and projecting, sides convex broader in front than behind, a deep and wide constriction at meso-epinotal suture. Epinotum broader than long, sharply margined on sides, each posterior angle produced in a long sharp spine directed backward, longer than their distance apart at base. In profile pro-mesonotum strongly convex, dome-shaped, borders sharp, with an erect blunt tubercle-like spine on each side marking junction of pronotum and mesonotum. Epinotum flat and straight, declivity straight, as long as dorsum, spines on posterior angles almost as long as dorsum, straight and parallel, directed backward almost level with dorsum. Node with a long broad spine at the middle of each side, directed outward and upward, sharply convex in front, apex turned up, erect, tubercle-like, dorsum flattened, in profile triangular, anterior superior edge forming the apex, dorsum and posterior faces united, straight, as long as anterior face, lateral spines sharp pointed, broad at base, slightly longer than their distance from anterior edge. Ventral spine long and broad,

bluntly pointed, directed forward at an acute angle. Postpetiole one-third broader than long, broadest just behind middle. First segment of gaster slightly broader than long, strongly convex, egg-shaped. Legs short and robust. Femora incrassated.

Female.—Length 5 mm. (Deälated.)

Similar to worker but larger and more robust. Sculpture slightly coarser. Wing sclerites fully developed, wing stumps present. Spines on epinotum shorter and stouter.

Male.—Length 3.5 mm.

Black; mandibles, antennae and tarsi yellow, femora and tibiae brown.

Shining. Mandibles finely striate at base. Head with some widely spaced longitudinally striae, densely reticulate between the striae. Thorax and node finely and densely reticulate, coarser on mesonotum. Postpetiole very finely striate longitudinally, base of gaster finely striate longitudinally.

Hair yellow, short and erect, sparse throughout. Pubescence grey, apparent only on gaster.

Head, including mandibles, slightly longer than broad across eyes, strongly convex behind, straight and parallel in front of eyes. Mandibles short, triangular, finely dentate. Clypeus broad, convex above and in front. Frontal area large, triangular. Frontal carinae indicated, antennae with thirteen segments, insertions exposed. Scapes extend to posterior fourth of head, first segment of funiculus twice as long as broad, second segment half as thick and one-third longer than first, first to eighth at least twice as long as broad, increasing in thickness from the ninth to apical, somewhat clavate, apical bluntly pointed, as long as the three preceding together. Eyes hemispherical, protruding, placed in front of the middle of sides. Ocelli small, not prominent. Thorax twice as long as broad. Pronotum hardly seen from above, appearing as a narrow margin to scutellum, strongly convex in front and sides. Scutellum very slightly longer than broad, strongly convex in front, mayrian furrows deep and wide, parapsidal furrows sharply impressed. Mesonotum as long as broad, feebly convex in front, strongly convex transversely. In profile pronotum short and erect, top edge projecting slightly. Scutellum high, dorsum slightly concave in middle, anterior face concave, ending in a short rounded projection at apex below. Mesonotum fully twice as long as high, convex above, overhanging epinotum. Dorsum and declivity of epinotum short and convex. Node as long as broad, hexagonal, dorsum convex, in profile dome-shaped, ventral spine obsolete. Postpetiole almost one-third broader than long, broadly hexagonal, sides angular and

broadest at middle, dorsum convex. First segment of gaster as long as broad, sides evenly convex. Legs slender, femora slightly thickened near base. Genitalia retracted.

Habitat.—Reevesby Island.

A large nest of this species was found in a dead tree.

Genus **Crematogaster** Lund.

CREMATOGASTER (ACROCOELIA) LAEVICEPS Smith
var. CHASEI Forel.

Crematogaster (Acrocoelia) laeviceps Smith var. *chasei* Forel, Rev. Suisse Zool., x., p. 413, 1902, ♂.

Very abundant in most parts of Reevesby Island. Most of the dead trees contained a nest, with workers, females and males.

Originally described from Perth, Western Australia, it is widely distributed throughout Australia.

Genus **Xiphomyrmex** Forel.

XIPHOMYRMEX FLAVIGASTER sp. n.

(Fig. 5.)

Worker.—Length 3–3.5 mm.

Head, thorax and nodes reddish brown, mandibles, antennae and legs reddish yellow, gaster lighter.

Mandibles finely striate longitudinally. Clypeus smooth and shining. Head longitudinally striate-rugose. Thorax and nodes irregularly rugose. Gaster and legs smooth and shining.

Hair yellow, abundant, long and erect, shorter and sub-erect on antennae and legs. Pubescence not apparent except on antennae.

Head as long as broad, almost circular. Mandibles short, triangular, furnished with four sharp teeth. Clypeus raised, slightly concave in middle above, the concavity bordered at each side by a sharp ridge, anterior edge produced forward, concave in middle, sides straight, angles sharp. Frontal area small, continued backward as a short groove. Frontal carinae short, flattened, as long as broad in front. Scares barely extend to occipital border. First segment of funiculus as long as second and third together, apical segment as long as the three preceding together. Eyes small, convex, placed at middle of sides. Thorax one-fourth longer than broad, suture not marked. Pro-mesonotum strongly convex in all directions, epinotum short, convex transversely, each posterior angle produced as a long slender, sharp spine, directed backward and slightly outward, twice as long as

their distance apart at base, two shorter and thicker spines at bottom of declivity. In profile strongly convex from apex to base of epinotal spines, declivity vertical, short, dorsal spines slender, twice as long as spines at bottom. Node slightly broader than long, convex in all directions; in profile dome-shaped, slightly longer than stalk in front, ventral surface concave in middle. Postpetiole barely twice as broad as long, ovate, dorsum convex. First segment of gaster as long as broad, sides strongly convex. Legs slender.

Habitat.—Reevesby Island.

Small nests at roots of small shrubs.

Genus **Meranoplus** Smith.

MERANOPLUS EXCAVATUS sp. n.

(Fig. 6.)

Worker.—Length 2.5–3 mm.

Reddish yellow, mandibles, antennae and legs lighter yellow.

Head, thorax, node and postpetiole coarsely and densely punctate, thimble-like, punctures shining at bottom. Mandibles finely striate longitudinally. Gaster very finely and densely reticulate, with some large scattered punctures.

Hair yellow, erect, short, abundant throughout. No pubescence.

Head as long as broad, occipital border and sides convex, angles rounded. Mandibles triangular, furnished with small sharp teeth. Clypeus broad, overhanging mandibles, widely and deeply excavated in front. Frontal carinae straight and parallel, widely separated, forming a strong ridge to antennal scrobe, the latter deep, extending to occipital border. Scapes extend slightly beyond posterior margin of eye, subclavate. First segment of funiculus as long as second and third together, apical segment bluntly pointed as long as three preceding together. Eyes convex, placed at posterior third of sides. Thorax slightly broader than long, sutures not indicated. Pronotum convex in front, anterior angles sharply produced, directed outward and forward. Sides of pronotal region straight, much broader in front than behind, basal half of sides fringed with a translucent membrane, this membrane occupies a large cavity at the place of the pro-mesonotal suture, at the place of the meso-epinotal suture is another large cavity also filled by a transparent membrane; between these cavities is a broad plate-like projection with a sharp point directed forward. Posterior angles of epinotum spine-like, rather long and pointed, between the outer spines are two short tubercle-like projections. At the middle of epinotal declivity at each side is

a long slender sharp spine directed backward and slightly outward, extending to posterior face of node; in profile strongly convex above, pronotal spine sharp, directed forward and upward, epinotal spine shorter and thicker, sharp pointed, directed backward, epinotal declivity straight, at an obtuse angle, lateral spines slender, directed straight backward. Node three times broader than long, anterior border straight or feebly concave, posterior strongly convex; in profile triangular, the apex, or dorsum, sharp pointed, anterior face feebly concave, posterior face convex, a blunt spine directed forward on ventral surface. Postpetiole as long as broad, feebly convex in front, strongly convex behind and on sides; in profile dome-shaped. Gaster pear-shaped, one-sixth longer than broad, concave in front. First segment as long as broad, sides strongly convex. Legs short and stout.

Habitat.—Reevesby Island.

Several workers were found amongst leaf debris under shrubs. No nest was found.

Genus **Podomyrma** Smith.

PODOMYRMA ADELAIDAE (Smith).

Myrmica adelaidae Smith, Cat. Hymn. Brit. Mus., vi., p. 128, 1858, ♂.

Two workers were found on the Eucalypts at the north end of Reevesby Island. This species is widely distributed in Australia.

Genus **Monomorium** Mayr.

MONOMORIUM (NOTOMYRMEX) RUBRICEPS Mayr var. RUBA Forel.

Monomorium (Notomyrmex) rubriceps Mayr var. *rubra* Forel, Arkiv. f. Zool., 9, 16, p. 72, note, 1915, ♂.

A small nest was found in a rotten log on Reevesby Island. Originally described from New South Wales, this form has a wide distribution in southern Australia.

MONOMORIUM (NOTOMYRMEX) INSULARIS sp. n.

(Fig. 7.)

Worker.—Length 3–3.8 mm.

Reddish yellow throughout, apical margins of segments of gaster darker.

Smooth and shining. Mandibles and head with numerous small shallow punctures. Sides only of mesonotum and epinotum rugose, finely on top more coarsely below.

Hair yellow, erect, long and abundant on body, shorter and sub-erect on antennae and legs.

Head one-fifth longer than broad, sides and occipital border convex, angles strongly rounded. Mandibles furnished with five large sharp teeth. Clypeus bicarinate above, flattened between carinae, strongly produced in front, sides and front straight. Frontal carinae short, diverging outward behind. Scapes not extending to occipital border by fully their thickness. First segment of funiculus as long as second, third and fourth combined, apical segment as long as the three preceding together. Eyes placed slightly in front of middle of sides. Thorax twice as long as broad, meso-epinotal suture feebly defined. Pronotal area strongly convex in all directions, meso-epinotal area constricted. Epinotum very slightly longer than broad, posterior edge and angles sharp. In profile dorsum straight, meso-epinotal suture feebly impressed, pro-mesonotal suture indicated. Pronotum erect and strongly convex. Epinotal declivity at an obtuse angle, sub-bordered. Node oval, twice as broad as long, convex in all directions, in profile bluntly cone-shaped, higher than long, anterior face convex above, concave below, stalk slender. Postpetiole one-third broader than long, slightly broader in front than behind, convex in all directions, in profile dome-shaped. Gaster one-third longer than broad. First segment one-sixth broader than long, twice as broad behind as in front, sides convex. Legs long and slender.

Female.—Length 4.5 mm.

Colour and pilosity as in worker, sculpture slightly coarser.

Head broader, eyes larger, ocelli large and prominent. Scutellum large, convex, parapsidal furrows feebly indicated. Epinotum slightly concave in middle behind, transversely striate, angles sharp. Nodes similar; gaster larger.

Habitat.—Reevesly Island.

A small nest in ground under a small shrub.

MONOMORIUM (NOTOMYRMEX) FLAVIPES sp. n.

(Fig. 8.)

Worker.—Length 2.5–3 mm.

Head, thorax and gaster dark yellow, antennae, nodes and legs pale yellow.

Smooth and shining, some fine scattered piligerous punctures throughout, sides of mesonotum and epinotum reticulate.

Hair yellow, erect, long, abundant on gaster, sparse on head and thorax, short and sub-erect on antennae and legs.

Head one-fifth longer than broad, as broad in front as behind, sides evenly convex, occipital border straight or feebly concave, angles sharply rounded. Mandibles with five strong sharp teeth.

Clypeus convex above, with two sharp central carinae, anterior border sharply convex in middle. Frontal carinae straight, parallel. Scapes not extending to occipital border by their thickness. First segment of funiculus as long as four following combined; apical not as long as two preceding combined. Eyes small, placed in front of the middle of sides. Thorax twice as long as broad, meso-epinotal suture sharply impressed. Promesonotum one-fourth longer than broad, sides and front strongly convex, constricted at mesonotum, dorsum convex transversely. Epinotum longer than broad, convex transversely; in profile pronotum high, strongly convex in front, dorsum straight with a slight excision at meso-epinotal suture, epinotal declivity at an acute angle, half as long as dorsum, superior border sharply rounded. Node twice as broad as long, anterior and posterior edges straight, sides convex, in profile high and slender, longer than stalk in front, anterior face straight, dropping at an acute angle. Postpetiole twice as broad as long, convex in all directions; in profile hemispherical. First segment of gaster as long as broad, much broader behind than in front, sides convex. Legs robust.

Female.—Length 3.3 mm. (Deilated.)

Similar to worker but slightly larger and more robust. Colour darker. Sculpture on sides and epinotum coarser. Hairs longer and more abundant.

Habitat.—Reevesby Island.

A small nest was found under a stone at the north end of the island.

Genus **Solenopsis** Westwood.

SOLENOPHIS INSCULPTUS sp. n.

(Fig. 9.)

Worker.—Length 1-1.3 mm.

Pale yellow throughout, apex of mandibles darker.

Smooth and shining, with some fine scattered piligerous punctures, more numerous on head than elsewhere.

Hair yellow, long and erect, particularly on clypeus and apical segments of gaster, shorter and sub-erect on antennae and legs.

Head one-fifth longer than broad, sides convex, occipital border straight, angles rounded. Mandibles furnished with four large sharp teeth, all about equal in size. Clypeus strongly projecting and excised in front, the dorsal carinae terminating as spine-like projections at each side of excision. Frontal area small. Frontal carinae narrow. Scapes not extending to occipital border by one-third of their length. First segment of funiculus as long as

the five following combined, the two apical segments one and one-half times longer than rest of funiculus. Eyes small, slightly in front of anterior fourth of sides. Thorax one and three-quarter times longer than broad, meso-epinotal suture sharply impressed. Pro-mesonotum as long as broad, strongly convex in all directions; constricted at meso-epinotal suture; epinotum slightly longer than broad, convex transversely, in profile dorsum straight, meso-epinotal suture sharply impressed. Pronotum high and convex in front, epinotum evenly convex from base to bottom of declivity. Node one and one-half times broader than long, oval; in profile higher than long, anterior face straight, sloping forward below at an obtuse angle, dorsum bluntly pointed in front, convex and merged into declivity behind, ventral surface convex. Postpetiole one-fifth broader than long, convex in all directions; in profile dome-shaped. First segment of gaster as long as broad behind, strongly convex in front, feebly on sides. Legs short and stout.

Habitat.—Reevesby Island.

A small nest was found in the galleries of a termite (*Calotermes condonensis* Hill) in a dead tree. Near *S. clarki* Crawley from Western Australia, but is distinguished by the form of the thorax and nodes.

Genus **Pheidole** Westwood.

PHEIDOLE PYRIFORMIS sp. n.

(Figs. 10-11.)

Worker major.—Length 4.2 mm.

Mandibles, head and legs brownish red, mandibles edged with black, thorax and nodes brown, gaster black, funiculi and tibiae yellowish red.

Mandibles smooth and shining, finely punctate. Head finely striate longitudinally in front, smooth and shining behind, from frontal carinae to occipital border, with some fine shallow scattered punctures. Pro-mesonotum densely reticulate, some obsolete rugae in middle. Epinotum more coarsely reticulate. Sides of thorax reticulate as on epinotum, more rugose on epinotum. Nodes very finely and densely reticulate.

Hair yellow, erect, long and abundant throughout, shorter and sub-erect on antennae and legs.

Head very slightly longer than broad, anterior half of sides straight and parallel, anterior angles sharp, posterior half convex, narrowing behind, occipital border deeply indented in middle giving the border a bilobed appearance, both lobes strongly convex. Mandibles massive, coarsely and irregularly dentate.

Clypeus short, raised and bicarinate in middle, concave between carinae, anterior edge almost straight, with a sharp projection at end of each carina, concave between projections. Frontal area large and deep, triangular. Frontal carinae not raised, widely diverging behind. Scapes extend beyond middle of head by almost their thickness. First segment of funiculus longer than the four following combined, apical as long as three preceding segments combined. Eyes very small, convex, their posterior edge placed at anterior third of sides. Thorax one and three-quarter times longer than broad, pronotum one-fourth broader than long, strongly convex, broadest behind. Mesonotum small and circular, very slightly broader than long. Epinotum one-fourth broader than long, concave in middle, ending at each side in a long sharp spine; in profile pro-mesonotum high, hemispherical, sutures not indicated, a slight tubercle-like projection near end of mesonotum. Meso-epinotal suture sharply impressed. Epinotum slightly convex, spines slender and sharp, directed upward and slightly backward, twice as long as their width at base, declivity abrupt, straight, as long as dorsum. Node twice as broad as long, anterior and posterior faces convex, dorsum concave transversely, the angles bluntly pointed; in profile bluntly pointed above, anterior face twice as long as posterior face. Post-petiole two and one-half times as broad as long, anterior and posterior faces convex, sides and dorsum bluntly pointed; in profile bluntly pointed above, both faces convex. First segment of gaster one-fourth broader than long, strongly convex above. Legs short and stout.

Worker minor.—Length 2.2–2.5 mm.

Colour and pilosity as in major worker, but mandibles yellow.

Mandibles finely striate near apex. Head shining, finely reticulate on cheeks and clypeus, a few short striae on cheeks. Pro-mesonotum smooth and shining. Epinotum and node finely and densely reticulate-punctate on top and sides.

Head as long as broad, occipital border concave in middle sides convex, angles broadly rounded. Mandibles furnished with two large sharp teeth in front, five or six small obsolete teeth behind. Clypeus short, truncate, very slightly produced in front. Frontal area triangular, large and deep. Scapes extend to occipital border. Eyes placed in front of middle of sides. Thorax twice as long as broad. Pro-mesonotum one-fifth longer than broad, pear-shaped, strongly constricted at mesonotum, convex in all directions. Epinotum sub-bordered, flat transversely. Spines directed more backward. Node straight, or very feebly concave, on top. Legs longer and more slender. Remainder as in major.

Habitat.—Reevesby Island (many nests), Winceby Island (one nest), and English Island (one specimen).

Sub-family DOLICHODERINAE Forel, 1878.

Genus **Iridomyrmex** Mayr.

IRIDOMYRMEX DETECTUS (Smith).

Formica detecta Sm., Cat. Hymn. Brit. Mus., vi., p. 36, 1858, ♀.

Formica purpurea Sm., l. c., p. 40, ♂.

Commonly known as the "Meat ant", this is the most abundant and widely distributed ant in Australia.

IRIDOMYRMEX DETECTUS Sm. var. VIRIDIAENUS Viehmeyer.

Iridomyrmex detectus Sm. var. *viridiaeneus* Viehmeyer, Arch. f. Naturg., 79, 12, p. 41, 1913, ♂.

The colour of this variety is deep metallic blue on the head, thorax and legs, the gaster brassy-green, in many examples the colour is violet, while some have the colour of the typical *I. detectus* Sm. This ant is common in the dry interior of Australia. Several nests were found on Reevesby Island. The nests are inconspicuous and are indicated by very small holes without a mound.

IRIDOMYRMEX PUNCTATISSIMA Emery.

Iridomyrmex punctatissima Emery, Ann. Mus. Stor. Nat. Genova, xxiv., p. 251, 1887, ♂.

Many small nests were found under loose bark on dead trees on Reevesby Island, one example was found on English Island. Widely distributed in Southern Australia.

IRIDOMYRMEX BICKNELLI Em.

Iridomyrmex bicknelli Emery, Rend. Accad. Sc. Bologna, p. 236, figs 6-7, 1897-8, ♂.

Abundant on Reevesby Island, this species nests in the ground. The workers run about rapidly during the heat of the day. This ant was recorded first from Tasmania, but is widely distributed throughout Australia.

IRIDOMYRMEX MATTIROLI Em. var. CONTINENTIS Forel.

*Iridomyrmex mattirol*i Emery var. *continentis* Forel, Fauna Sudwest Austral, i., p. 290, 1907, ♂ ♀ ♂.

Several small nests of this common Western Australian ant were found on Reevesby and Winceby Islands. The nest is in the ground and surmounted by a small crater-shaped mound about 1-inch high.

IRIDOMYRMEX DROMUS sp. n.

(Fig. 12.)

Worker.—Length 3.3 mm.

Pale yellow, head and gaster darker.

Very finely and densely reticulate throughout.

Hair yellow, short and sparse, longer and more abundant on apical segments of gaster. Pubescence abundant, yellow, very short and adpressed.

Head slightly longer than broad, much broader behind than in front, occipital border straight or feebly convex, sides strongly convex, angles broadly rounded. Mandibles broad, two and one-half times shorter than head, apical border furnished with five large sharp teeth, directed backward, and some fine denticles between the teeth, inner border finely denticulate. Clypeus convex both ways, anterior border straight, angles sharp. Frontal area large and shallow, triangular. Frontal carinae short and parallel, antennal insertions exposed. Scares extend beyond occipital border by almost one-third their length. First segment of funiculus one-fourth longer than second, others sub-equal, apical as long as the two preceding combined. Eyes large, rather flatly convex, placed at middle, more on front than on sides. Thorax two and one-half times as long as broad. Pronotum one-fifth broader than long, front, sides and dorsum convex. Mesonotal suture sharply impressed. Mesonotum as long as broad, convex in all directions, broader in front than behind. Meso-cpinotal suture deep and wide, spiracles prominent, placed on dorsum. Epinotum as long as broad, strongly convex transversely; in profile pro-mesonotum strongly convex, almost hemispherical, highest at suture. Dorsum and declivity of epinotum combined in a strong convexity. Node slender, fully twice as broad as long, convex on all sides, bluntly pointed; in profile higher than long, bluntly pointed above, anterior face convex, posterior face concave, stalk behind joined to gaster almost at ventral surface. Gaster one and two-thirds times longer than broad, all segments broader than long. Legs very long and slender.

Habitat.—Reevesby Island.

Nests of this species are abundant on the sand-dunes.

Genus **Bothriomyrmex** Emery.

BOTHRIOMYRMEX PUSILLUS (Mayr).

? Tapinoma pusillum Mayr, Jour. Mus. Godeff., xii., p. 83, 1876, ♂ ♀ ♂.

One small nest, containing the queen and several workers, was found in a dead tree stump on Reevesby Island.

Sub-family FORMICINAE Lepeletier, 1836.

Genus **Melophorus** Lubbock.

MELOPHORUS TURNERI Forel s. sp. AESOPUS Forel.

Melophorus turneri Forel s. sp. *aesopus* Forel, Rev. Suisse Zool., xviii., p. 64, 1910, ♂ ♀ ♂.

Many nests of this form were found in all parts of Reevesby Island.

Genus **Notoncus** Emery.

NOTONCUS ECTATOMMOIDES (Forel).

Camponotus ectatommoides Forel, Mitth. Schweiz. Ent. Ges., viii., p. 333, 1892, ♀.

Notoncus ectatommoides Emery, Ann. Soc. Ent. Belg., xxxix., p. 353, 1895, ♀.

No nest was found but many examples were found amongst leaf debris under shrubs on Reevesby Island.

Genus **Stigmacros** Forel.

STIGMACROS AEMULA Forel.

Acantholepis (Stigmacros) aemula Forel, Fauna Sudwest Austral., i., p. 298, 1907, ♀.

Several workers were found amongst leaf debris on Reevesby Island. This species is a common coastal form in Western Australia.

STIGMACROS FLAVINODIS sp. n.

(Fig. 13.)

Worker.—Length 2-2.3 mm.

Head, thorax, gaster and anterior coxae black, mandibles antennae, node and legs yellow.

Shining. Head, mandibles and gaster very finely punctate. Thorax very finely and densely reticulate, anterior face of node finely reticulate.

Hair yellow, long, very sparse, confined to clypeus and apical segments of gaster. Pubescence yellow, very short, fine and adpressed throughout.

Head as long as broad, occipital border feebly, sides strongly convex, angles rounded. Mandibles furnished with six large sharp teeth. Clypeus convex above, short, anterior border straight at middle. Frontal area feebly defined, triangular. Frontal carinae short and parallel, antennal insertions exposed. Scapes

extend beyond occipital border by their thickness. First segment of funiculus as long as the two following combined, apical as long or longer than the two preceding combined. Eyes large and convex, placed at middle of sides. Thorax one-third longer than broad, sutures sharply impressed. Pronotum fully twice as broad as long, sides and front feebly convex, angles broadly rounded. Mesonotum one-fourth broader than long, almost twice as broad in front as behind, sides and front convex, posterior border straight, meso-epinotal suture wide and very deep. Epinotum twice as broad as long, broadest behind, sides feebly convex, posterior border feebly concave; in profile feebly convex, superior border margined, pro-mesonotal suture sharply impressed, meso-epinotal suture very deep and wide, twice as deep as wide, wedge-shaped. Pronotum dropping abruptly in front, concave, dorsum convex. Mesonotum feebly convex, truncate behind, three times longer than the truncate face behind, posterior angle sharply rounded. Epinotum straight, one-third shorter than declivity, the spine as long as broad at base, posterior border of dorsum bluntly rounded, anterior face dropping at an acute angle, straight. Node scale-like, broad, convex in front, concave behind, the angles feebly produced backward, in profile slender, anterior face convex, posterior face concave, dorsum sharp, midway between base and apex at each side is a small blunt spine. Gaster one-third longer than broad strongly convex. Legs short and robust.

Habitat.—Reevesby Island.

Several specimens were found amongst dead leaves.

Genus **Camponotus** Mayr.

CAMPONOTUS (MYRMOPHYMA) CHALCEOIDES sp. n.

(Figs. 14-16.)

Worker major.—Length 9.3-9.7 mm.

Head, thorax and node metallic bronze-black, gaster iridescent bronze with the anterior and apical margins of segments metallic green, femora and tibiae brownish black, tarsi reddish brown. On several specimens the epinotum more or less red.

Mandibles coarsely striate-rugose and punctate, whole body finely and very densely reticulate throughout except on legs, scapes and legs shining, finely punctate.

Hair yellow, erect, short and abundant throughout, some extra long hairs on clypeus. Pubescence not apparent.

Head as long as broad, occipital border straight, sides convex, angles broadly rounded. Mandibles furnished with four long, broad sharp teeth. Clypeus flatly convex above, strongly projecting in front, convex, with a short deep concave excision in middle,

Frontal area triangular, feebly defined. Frontal carinae as long as broad behind, much broader behind than in front, a fine longitudinal groove between them. Scapes extend beyond occipital border by one-fifth their length. First segment of funiculus one-fifth longer than second, remainder sub-equal, apical as long as the two preceding combined. Eyes small, rather flat, their anterior edge behind the middle of sides. Anterior ocellus very small, placed in a large puncture, posterior ocelli lacking. Thorax barely twice as long as broad, sutures sharply impressed. Pronotum two and one-half times broader than long, sides, front and top strongly convex, concave behind. Mesonotum slightly broader than long, almost circular, strongly convex in all directions. Spiracles prominent. Epinotum slightly longer than broad, strongly convex transversely; in profile pronotum strongly convex from apex to base. Mesonotum feebly convex, highest in front. Epinotum feebly concave in middle one and one-half times longer than declivity into which it is rounded. Node fully twice as broad as long, bluntly pointed above, sides and anterior face convex, posterior face straight; in profile twice as high as long, anterior and posterior faces convex, bluntly pointed above. Gaster longer than broad. First segment twice as broad as long, strongly convex in front, almost hemispherical. Legs long and slender.

Worker media.—Length 7.5–8 mm.

Colour, sculpture and pilosity as in the major, with the epinotum more often rose-red.

Head one-fifth longer than broad, sides almost parallel. Scapes extend beyond occipital border by one-third their length. Epinotum, in profile, much more concave, and lower than mesonotum. Node thicker, more rounded on top.

Worker minor.—Length 6.5–7 mm.

Colour, sculpture and pilosity as in the major, epinotum red.

Head one-fifth longer than broad, strongly convex behind eyes, sides convex. Scapes extend beyond occipital border by half their length, epinotum more concave than in major and media, and node thicker, convex on top.

Habitat.—Reevesby Island.

South Australia: Port Lincoln, Kyancutta.

Western Australia: Balladonia.

Several nests were found in rotten trees on Reevesby Island. Many single examples of the worker minor have been received in the past from the other localities. This species is more highly coloured than *Camponotus chaldeus* Crawley from Western Australia, but has a slight resemblance.

CAMPONOTUS (MYRMOPHYMA) CERISEIPES sp. n.

(Figs. 17-19.)

Worker.—Length 12 mm.

Mandibles and head dark brown, with some lighter and darker tints. Thorax reddish brown, tinged darker in places. Scapes, node and gaster black, femora reddish yellow, tibiae and tarsi brown. Apical half of mandibles coarsely striate-rugose, smooth and punctate at base. Remainder of body very finely and densely reticulate, with fine shallow scattered punctures.

Hair yellow, long and erect on mandibles, clypeus and gaster, sparse elsewhere. Pubescence short and adpressed, apparent only on legs.

Head one-seventh broader than long, occipital border straight, sides strongly convex, angles rounded. Mandibles furnished with six large sharp teeth. Clypeus convex above and in front, subcarinate, anterior edge feebly crenulate. Frontal area triangular, small and shallow. Frontal carinae as long as broad behind, twice as broad behind as in front. Scapes extend beyond occipital border by almost one-fourth their length. First and third segments of funiculus equal in length, slightly longer than second, apical segment twice as long as the preceding. Eyes rather small and flatly convex. Only anterior ocellus present, very small, situated in a rather deep pit. Thorax one and one-half times longer than broad. Pro-mesonotal suture deeply impressed, meso-epinotal suture wide and shallow. Pronotum fully twice as broad as long, sides strongly convex. Mesonotum very slightly broader than long, circular, dorsum strongly convex all ways. Epinotum convex transversely, as long as broad; in profile pronotum and mesonotum convex, excised at suture, epinotum straight in front, rounded into declivity behind, declivity feebly concave, as long as dorsum. Node slender, scale-like, convex in front, straight behind; in profile twice as high as long, sharply pointed, anterior face convex, posterior face straight. Gaster one and one-half times longer than broad. First segment twice as broad as long, strongly convex in front. Legs long and stout.

Worker media.—Length 9.5-10 mm.

Black, femora light yellowish red, funiculi brown.

Sculpture and pilosity as in worker major.

Head very slightly broader than long, occipital border slightly convex. Scapes extend beyond occipital border by almost one-fourth their length. In profile the epinotum lower and node much thicker than in worker major.

Worker minor.—Length 7-7.5 mm.

Colour, sculpture and pilosity as in worker media.

Head one-seventh longer than broad, strongly convex behind eyes. Scapes extend beyond occipital border by almost half their length, thorax one and three-quarter times longer than broad; in profile mesonotum higher in front and more convex. Node thicker, as long as high, parallel, dorsum rounded.

Habitat.—Reevesby Island

A small nest was found in the ground at the north end of the island.

CAMPONOTUS (TANAEMYRMEX) MYOPORUS sp. n.

(Figs. 20-22.)

Worker major.—Length 8-9 mm.

Mandibles, front of head, scapes and gaster black; occiput, thorax and node brown, funiculi and all legs yellow.

Mandibles finely striate near apex, shining at base, remainder of body very finely and densely reticulate with scattered small shallow punctures.

Hair yellow, long and erect, rather scattered on thorax and gaster, very short and sub-erect on antennae and legs. Pubescence very fine and adpressed throughout.

Head a fraction broader than long, occipital border feebly, sides strongly convex, angles rounded. Mandibles with five or six large sharp teeth. Clypeus flatly convex above, strongly projecting in front, anterior border straight, fully half the width of clypeus, angles sharp. Frontal area triangular, small and shallow. Frontal ridges one-fourth longer than broad behind, a faint longitudinal groove in middle. Scapes extend beyond occipital border by almost one-fourth their length, first and third segments of funiculus equal in length, one-sixth longer than second, apical very slightly longer than preceding segment. Eyes large, rather flatly convex. Thorax almost twice as long as broad, promesonotal suture sharply and deeply impressed, meso-epinotal suture feebly impressed. Pronotum one and three-quarter times broader than long, strongly convex in front and on sides. Mesonotum very slightly broader than long, convex in all directions. Epinotum slightly longer than broad, convex transversely; in profile evenly convex longitudinally, sutures sharply defined, epinotal declivity barely as long as dorsum into which it is broadly rounded. Node twice as broad as long, oval, sharply pointed above; in profile barely twice as high as long, anterior and posterior faces convex, sharp pointed on top. Gaster one-fifth longer than broad. First segment three times broader than long, strongly convex in front. Legs long and stout.

Worker media.—Length 6.5-7 mm.

Mandibles and gaster black, head and scapes brown, thorax, funiculi and node reddish yellow, legs yellow.

Sculpture and pilosity as in worker major.

Head as long as broad, occipital border and sides convex, angles broadly rounded. Mandibles with six large sharp teeth, decreasing in size towards base. Clypeus convex above, projecting and sharply convex in front, bluntly pointed. Frontal area large and shallow, triangular. Scapes extend beyond occipital border by one-third their length, funiculus as in major worker. Eyes more convex, placed far back, almost their diameter from occipital border. Thorax twice as long as broad, strongly constricted at meso-epinotal junction; in profile like major worker, but epinotal declivity shorter. Node and gaster similar. Legs more slender.

Worker minor.—Length 4.5–5 mm.

Colour, sculpture and pilosity as in worker media.

Head one-sixth longer than broad, strongly convex behind eyes, feebly convex in front. Scapes extend beyond occipital border by almost half their length. Thorax fully twice as long as broad; in profile pronotum feebly convex. Mesonotum high and convex in front, forming a straight edge with epinotum behind, declivity short, strongly rounded into dorsum. Node one-fourth broader than long, oval, top edge sharp, transversely convex; in profile higher than long, bluntly pointed above. Gaster and legs as in worker media.

Habitat.—Reevesby Island.

A small nest was found in a dead limb of the "Native juniper" or "boobialla" (*Myoporum insulare* R. Br.).

CAMPONOTUS (COLOBOPSIS) MUTILATUS (Smith).

Formica mutilata Sm., Jour. Linn. Soc., Lond., iii., p. 137, 1858, ♂.

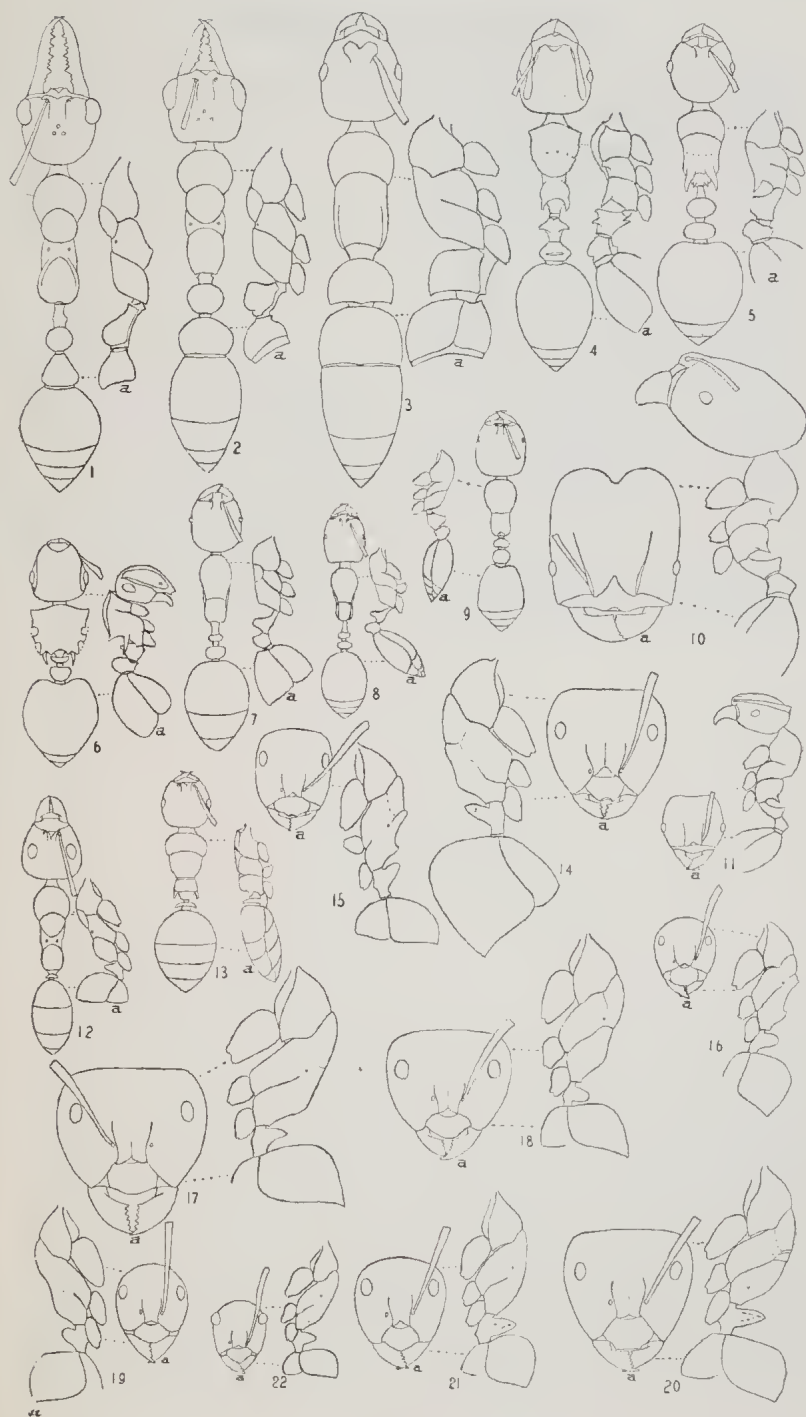
Many major and minor workers were taken from a nest in a small tree near the camp.

Genus **Polyrhachis** Shuckard.

POLYRHACHIS (CAMPOMYRMA) SIDNICA Mayr.

Polyrhachis (Campomyrma) sidnica Mayr, Verh. Zool. bot. Ges. Wien., xvi., p. 886, 1866, ♂ ♀.

Three nests of this widely distributed species were found on Reevesby Island.



FIGS. 1-20.

Explanation of Figures.

1. *Myrmecia gracilis* Emery. Worker. a. Side view.
2. *Myrmecia* (*Promyrmecia*) *dichospila* sp. n. Worker. a. Side view.
3. *Eubothroponera brunnipes* sp. n. Worker.
4. *Dacryon nitida* sp. n. Worker.
5. *Xiphomyrmex flavigaster* sp. n. Worker.
6. *Meranoplus excavatus* sp. n. Worker.
7. *Monomerium* (*Notomyrmex*) *insularis* sp. n. Worker.
8. *Monomerium* (*Notomyrmex*) *flavipes* sp. n. Worker.
9. *Solenopsis insculptus* sp. n. Worker.
10. *Pheidole pyriformis* sp. n. Worker major.
11. *Pheidole pyriformis* sp. n. Worker minor.
12. *Iridomyrmex dromus* sp. n. Worker.
13. *Stigmatopora flavinodis* sp. n. Worker.
14. *Camponotus* (*Myrmophyina*) *chalceoides* sp. n. Worker major.
15. *Camponotus* (*Myrmophyina*) *chalceoides* sp. n. Worker media.
16. *Camponotus* (*Myrmophyina*) *chalceoides* sp. n. Worker minor.
17. *Camponotus* (*Myrmophyina*) *ceriscipes* sp. n. Worker major.
18. *Camponotus* (*Myrmophyina*) *ceriscipes* sp. n. Worker media.
19. *Camponotus* (*Myrmophyina*) *ceriscipes* sp. n. Worker minor.
20. *Camponotus* (*Tanacmyrmex*) *myoporoides* sp. n. Worker major.
21. *Camponotus* (*Tanacmyrmex*) *myoporoides* sp. n. Worker media.
22. *Camponotus* (*Tanacmyrmex*) *myoporoides* sp. n. Worker minor.

11. *Reptilia*, Part 1: *General*.

By J. A. TUBB, M.Sc.

Representatives of the twelve species described and figured were found on Reevesby Island, which was the most intensively surveyed of the Group, and it is probable that many of these forms, notably the smaller skinks, will be found on the other Islands.

Correlated with the habitat, all forms except the Black Tiger Snake (*Notechis scutatus* var. *niger* Kinghorn) are grey or brown, with lighter markings. Also, species with the limbs reduced or absent form an important part of the population. Well developed limbs occur in *Sphenomorphus australis* (Gray), three of the four species of *Ablepharus* and in *Phyllodactylus marmoratus* (Gray), the former are active non-burrowing species and the Gecko is a typical climbing form. The conspicuous coloration and abundance of *Notechis* may be attributed to the absence of natural enemies, except possibly the *Varanus*.

Only the most significant references are given, and the measurements of all species are expressed in millimetres.

OPIHIDIA.

Family: COLUBRIDAE.

Subfamily: ELAPINAE.

Genus **Notechis***NOTECHIS SCUTATUS* var. *NIGER* Kinghorn, 1921.(Fig. 1, *a-d*.)*Notechis scutatus* var. *niger* Kinghorn, 1921, Rec. Aust. Mus. Sydney, xiii., p. 145, pl. xxvi.

Eye as long or little shorter than distance from mouth in adult, larger in young. Rostral broader than deep, portion visible from above less than half as long as distance from frontal; frontal as long as, or slightly longer than, broad, once and one half to twice as broad as supraocular, as long as its distance from rostral, half to two-thirds as long as parietals; nasals in contact with single pre-ocular; two post-oculars; temporals usually 2 plus 2, lower anterior very large, wedged between fifth and sixth upper labials, sometimes reaches lip; six upper labials, third and fourth entering orbit; three lower labials in contact with anterior chin shields; anterior chin shields as long as or little shorter than posterior. Scales in 17-21 rows; ventrals 163-173; anal entire; subcaudals 48-54.

Dorsum shining black: venter dark grey, occasionally with light grey or white markings on the neck and lips. Young forms sometimes show traces of transverse bands, the bands appear as narrow light grey lines. Transverse bands are visible in some adults when preserved in spirit.

Specimen.	Length.	Tail.	Ventrals.	Subcaudals.	Rows.	Upper Labials.
A	1,232	215	172	54	18-21	6
B	654	107	163	48	17	6
C	632	94	166	49	17-18	6
D	1,131	160	173	50	17-18	6
*E	..	..	..	..	..	5
†F	..	..	..	..	..	6
†G	..	..	..	..	..	6

* Lower anterior temporal fused with sixth upper labial on each side, almost complete fusion on left, distinct cleft on right, parietals and anterior nuchals much distorted. (Fig. 1 a-b).

† Head only.

The specimens agree closely with the observations of Kellaway and Thomson (1932, Aust. J. Exp. Biol., x., pp. 35-46, figs. 1-16) on melanotic Tiger Snakes from Chappell Island.

Specimen B corresponds almost exactly with Kinghorn's redescription of *Notechis ater* Krefft, but possesses six upper labials on each side. Also, in this specimen, the anterior and posterior chin shields are of equal length, although in the other snakes examined the posterior shields are the longer. These facts support the suggestion of Kellaway and Thomson (1932, *loc. cit.*) that *N. ater* Krefft should be relegated to the synonymy of *N. scutatus* var. *niger* Kinghorn. The observations of Kellaway and Williams (1935, Aust. J. Exp. Biol. xiii., pp. 17-21) support the elevation of the melanotic form to varietal but not to specific rank, since the "venoms are too nearly alike antigenically to support the erection of a new species."

N. scutatus var. *niger* Kinghorn was observed on Reevesby and Roxby Islands, and was reported to occur on Marum, Partney, and Lusby Islands. Mr. Scrubby, lessee of Spilsby Island, reported that "Black Snakes" had been plentiful on that island, but had been completely exterminated by "Goannas" (*Varanus* sp.) which he had introduced from the mainland.

The black Tiger Snakes were shy and generally sluggish in their movements. They were usually found basking under the edges of thick bushes. One case was noted in which the snake was resting on top of a leafy shrub, and several of these reptiles were observed climbing through the branches of dead bushes.

When alarmed, the snakes flatten the neck, giving a cobra-like appearance. This flattening may occur when the reptile is coiled or when it is moving slowly along. In the latter case, the anterior one-third to one-quarter of the body is raised above the ground and the head moved slowly from side to side. The strike is very rapid, and the bite usually of short duration. In a few instances, when under provocation, the snake was observed to bite and chew the object struck. The food of these snakes appears to consist largely of birds, and the stomachs of specimens from the south end of Reevesby Island invariably yielded traces of one or more Storm Petrels (*Pelagodroma marina*). Specimens from the south end of the island were consistently larger and in better condition than those from the centre and north of the island.

ACANTHOPIIIS ANTARCTICUS (Shaw, 1794).

The Death Adder was reported to occur on Reevesby Island but was not observed by the Expedition.

LACERTILIA.

Family: GECKONIDAE.

Genus **Phyllodactylus**

PHYLLODACTYLUS MARMORATUS (Gray, 1845).

(Fig. 2.)

Diplodactylus marmoratus Gray, 1845, Brit. Mus. Cat. Lizards, p. 149.

Phyllodactylus marmoratus Boulenger, 1885, Brit. Mus. Cat. Lizards, i., p. 88, pl. vii., fig. 6.

Dorsally light brown, marbled with darker brown, white and deep yellow; tail similar, usually with more pronounced yellow markings; venter white, often with minute brown spots.

Specimen.	Length.	Head.		Body.	Forelimb.	Hindlimb.	Tail.
		Length.	Width.				
A	72	10	7	18	10·5	13	40
B	76	10	7	21	12	16	41
C	72	10	7	18	10·5	13·5	40
D	69	9	6·5	17·5	10	12	38
E	52	8·5	5·5	15	9	11	31
F	82	10	7	22	12	15	43
*G	72	11	8	22	12·5	17	35
*H	75	11	8	22·5	12·5	15	40

* Tail regenerating.

This species was found on Reevesby, Spilsby, Roxby, Stickney and English Islands, under stones, in the debris at the bases of shrubs or tussocks or ascending the branches of the undergrowth.

Nocturnal in habit. Fresh eggs were common, usually occurring in twos or threes. On January 8th, two "community nests" (?) were discovered, one containing five eggs, the other containing fourteen.

The species has been recorded from southern Australia, Norfolk, Lord Howe, and Kangaroo Islands, and the islands of the Nuyts Archipelago and the Investigator Group.

Family: VARANIDAE.

Genus **Varanus**

VARANUS VARIUS (Shaw, 1794).

(Fig. 3.)

Lacerta varia Shaw, 1794, in White's Voy. N.S.Wales, p. 246, pl. iii., fig. 2.

Varanus varius Boulenger, 1885, Brit. Mus. Cat. Lizards, ii., p. 319.

Habit robust. Teeth acute, compressed. Snout depressed at tip, measuring 1.2 times distance from anterior border of orbit to ear. Digits short stout. Tail compressed, keeled. Scales of head small simple, equal to those of temples, temporal scales tectiform; supraocular scales very small, equal; sublabial scales slightly larger than anterior gular scales. Scales on upper surfaces small, oval, tectiform; abdominal scales similar but larger, in 100-110 transverse series. Caudal scales enlarged, keeled; caudal keel on posterior two-thirds of tail; keel with doubly toothed crest.

Upper surfaces black with numerous minute white spots which are arranged to form indistinct light bands; limbs black with larger white spots. Basal half of tail similar to trunk, distal half with numerous black and grey annuli; ventral surfaces white.

Specimen.	Length.	Head.	Neck.	Body.	Forelimb.	Hindlimb.	Tail.
A	1,129	84	110	270	110	160	665
B	975	70	90	250	110	150	565
C	759	52	70	175	95	120	462

This monitor differs in several minor respects from both *V. varius varius* and *V. varius bellii*, notably in coloration, in which it appears to be intermediate between the two subspecies, and in the short stout digits. Mr. Arthur Loveridge, of the Museum of Comparative Zoology, Harvard, who was consulted on this point, considers that the form may be worthy of

subspecific rank, particularly since it is an insular animal, but it is felt that since no mainland forms from similar country in South Australia are available for comparison, it is better to list the species as *Varanus varius sens. lat.* until more material comes to hand.

This form was found only on Reevesby Island, where it occurs in fairly large numbers. They are burrowing forms, and the burrows appear to be quite regular in size and arrangement of passages (Fig. 3). The burrows are 3-4 feet long and about 6 inches in diameter, the main gallery is L-shaped, with a second L-shaped gallery opening near the angle. The roofs of the burrows examined were never more than 1 foot, usually 6-9 inches below the surface of the ground.

Family SCINCIDAE.

Genus **Trachysaurus.**

TRACHYSAURUS RUGOSUS Gray, 1827.

Trachysaurus rugosus Gray, 1827, King's Voy, Aust., ii., p. 430.

Dorsum black, sparsely spotted with creamy white, spots in 7-9 irregular transverse bands; sides cream, spotted with black; venter mottled black and grey; under surface of tail with alternating bands of black and cream. Under suitable conditions, the whole of the back and sides may become black, with a corresponding darkening of the ventral surfaces.

Specimen.	Length.	Head.		Body.	Tail.
		Length.	Width.		
A	360	52	57	200	85
B	335	52	55	175	83
C	335	50	53	180	80
D	345	50	50	190	80
E	300	45	48	150	70
F	275	45	43	145	70
G	295	47	45	150	70
H	310	47	48	160	77
I	340	58	55	175	85
J	345	60	55	175	80
K	300	49	49	155	70

The species was found on Reevesby, Duffield, Spilsby, Hareby, Kirkby, Langton and Winceby Islands. Most common on Reevesby and Duffield Islands, this lizard appears to feed mainly on the seeds of the Boobyalla (*Myoporum insulare*) and of *Mesembryanthemum crystallinum*. Very young specimens were found early in December.

Recorded from New South Wales, Western and South Australia, Victoria, Gayndah (Queensland), Houtman's Abrolhos, Dirk Hartog Island, and Kangaroo Island (introduced).

Genus **Sphenomorphus**.

SPHENOMORPHUS AUSTRALIS AUSTRALIS (Gray, 1838).

(Fig. 4.)

Tiliqua australis Gray, 1838, Ann. Nat. Hist., ii., p. 291.

Sphenomorphus australis australis Loveridge, 1934, Bull. Mus. Comp. Zool. Harvard, lxxvii., 6, p. 345.

Prefrontals separate; frontal in contact with frontonasal (Specimen A); prefrontals in contact, frontal and frontonasal separate (Specimen B). Hindlimb pressed forward reaches shoulder (Specimen A). Hindlimb reaches elbow of adpressed forelimb (Specimen B).

Upper surface dark brown to black, with four continuous lines of white or light brown and four longitudinal lines of light-brown spots; sides mottled brown and white, venter white.

Specimen.	Length.	Head.		Body.	Forelimb.	Hindlimb.	Tail.
		Length.	Height.				
A	185	13	10	37	23	36	120
B	190	14	10	45	21	34	118

This species was found on Reevesby, Roxby, Stickney, Partney, Marum and Spilsby Islands, and was extremely common.

Recorded from many parts of Australia and adjacent islands.

Genus **Hemiergis**.

HEMIERGIS PERONII (Fitzinger, 1826).

(Fig. 5.)

Seps peronii Fitzinger, 1826, Neue Classif. Rept., p. 53.

Lygosoma (Hemiergis) peronii Boulenger, 1887, Brit. Mus. Cat. Lizards, iii., p. 326.

Golden or light brown above, with numerous black spots arranged in more or less continuous lines. Sides heavily spotted with black. Ventral scales white, each with a central black spot, one or two rows near the midventral line may be without spots. Subcaudal scales heavily barred with black.

Specimen.	Length.	Head.		Body.	Forelimb.	Hindlimb.	Tail.
		Length.	Width.				
A	164	7·5	6·5	50	8	12·5	97
*B	159	9	7	43	8	15	97
†C	130	8	6·5	32	8	12·5	68
†D	156	7·5	6	46	7	12	41
†E	131	8	6	41	7	12·5	75
†F	114	8	6·5	51	7	12	58
†G	108	9	7	40	7	12	53
†H	111	8	6·5	37	8	13	59
†I	97	7·5	6	35	7·5	12	37

* Each interparietal divided into two by a transverse suture.

† Tail regenerating.

This species was found on Reevesby, English, Stickney, Roxby and Marum Islands.

Recorded from Western and South Australia, Victoria, and the South Neptunes, Black Rock, St. Francis, Kangaroo, Flinders, Price and Pearson Islands.

Genus **Rhodona**.

RHODONA TETRADACTYLA Lucas and Frost, 1895.

(Fig. 6.)

Rhodona tetradactyla Lucas & Frost, 1895, Proc. Roy. Soc. Vict., vii., n.s., p. 268.

non *Mocoo tetradactyla* O'Shaugnessy, 1879, Ann. Mag. Nat. Hist., (5), iv., p. 300.

Lygosoma (Rhodona) frosti Zeitz, 1920, Rec. S. Aust. Mus., i., p. 217.

Body slender, elongate; limbs short, tetradactyle. Snout short obtuse. Lower eyelid with transparent disc. Nostril pierced in large nasal; frontonasal forming short suture with rostral, broadly in contact with frontal; prefrontals present, small, widely separated; frontal large, broad, in contact with first and second supra-oculars; 4 supra-oculars, second largest; 5 supraciliaries; 3 upper labials anterior to subocular; frontoparietals in contact behind interparietal; frontoparietals and interparietal small, subequal; 2 pairs of nuchals. Ear opening small, distinct. Eighteen scales around middle of body; subdigital lamellae keeled, 15-16 lamellae under third toe.

Dorsally silver-grey or light brown with four longitudinal rows of black spots, spots in the two inner rows almost confluent; a well marked lateral black stripe extending from the nostril to the tail; ventral surface silvery or bluish white, with a few irregularly spaced black spots.

Specimen.	Length.	Head.		Body.	Forelimb.	Hindlimb.	Tail.
		Length.	Width.				
A	99	6	4	36	6	12	49
B	78	6	4	42	6	11.5	..
*C	78	5.5	3.5	32	5	11.5	39

* Tail regenerating.

Found on Reevesby Island, not common.

Recorded from Central and South Australia and Flinders and the South Neptune Islands.

RHODONA PICTURATUM Fry, 1914.

(Fig. 7.)

Rhodona picturatum Fry, 1914, Rec. W. Aust. Mus., i, iii., p. 186, text-fig. 5, pl. xxvii., fig. 3.

Body elongate, slender. Snout subconical, projecting beyond lower jaw. Eye small; lower eyelid with transparent disc, rostral large, swollen; nasals in contact; frontonasals united into single shield which is broadly in contact with frontal; prefrontals present; frontal large, slightly longer than broad; frontoparietals and interparietals distinct; frontoparietals in contact behind interparietal; 2 pairs of nuchals; 5 upper labials, fourth entering orbit; 5 lower labials. Ear opening barely discernible. Eighteen scales around middle of body; 2 enlarged preanals. Forelimbs present as minute scaly spurs; hindlimbs didactyle, outer toe twice as long as inner.

Silver grey above, a broad lateral brown band extends from the nuchal scales almost to the tip of the tail; a short row of widely separated brown spots on each side from above the anus to about halfway along the tail; ventral surfaces white. Head scales edged with brown.

Specimen.	Length.	Head.		Body.	Forelimb.	Hindlimb.	Tail.
		Length.	Width.				
A	72	4.5	2.5	28	trace	7	30

One specimen was taken on Reevesby Island.

Recorded from Perth and Boulder (West Australia).

Genus **Ablepharus**.

ABLEPHARUS LINEO-OCCELLATUS Dumeril and Bibron, 1839.

(Fig. 8.)

Ablepharus lineo-ocellatus Dumeril & Bibron, 1839, *Erpétologie Générale*, v., p. 817.

Olive brown above, a black-edged white stripe extending from the nostril to the thigh, dorsally with numerous indistinct ocelli which extend over the tail; venter greenish white.

Specimen.	Length.	Head.		Body.	Forelimb.	Hindlimb.	Tail.
		Length.	Width.				
A	112	8·5	6	26	14	20·5	67

One specimen was found on Reevesby Island.

The species is widely distributed throughout Australia and has been found on Kangaroo and Flinders Islands.

ABLEPHARUS TAENIOPLEURUS Peters, 1874.

(Fig. 9.)

Ablepharus (Morethia) taeniopleurus Peters, 1874, *Mon.-Ber. Ak. Wiss. Berlin*, p. 375.

Form and head scalation closely similar to *A. lineo-ocellatus* Dumeril and Bibron; supranasals present; four supraciliaries on each side; dorsal circumorbital scales concealed; 30 scales around middle of body; ear opening without projecting lobules; scales on palms of hands and soles of feet acutely keeled; subdigital lamellae acutely keeled; 19 lamellae under fourth toe.

Olive brown above, with two lines of black spots; a black-edged white line extends from the nostril to a short distance behind the vent; venter bluish white; hands and feet pink.

Specimen.	Length.	Head.		Body.	Forelimb.	Hindlimb.	Tail.
		Length.	Width.				
A	93	8·5	5	30	14·5	19	48

One specimen was found on Reevesby Island.

Recorded from Bowen (Queensland) and Mount Robinson (West Australia).

ABLEPHARUS BOUTONII var. PERONII (Cocteau, 183-).

(Fig. 10.)

Cryptoblepharis peronii Cocteau, 183-, Et. Scinc., p. 1. (*fd. Blgr.*).*Ablepharus boutonii* var. *peronii* Boulenger, 1887, *loc. cit.*, p. 346.

Brown to olive above, with a well-defined light-grey lateral band; sides and legs marbled brown and grey; venter bluish white; head occasionally metallic.

Specimen.	Length.	Head.		Body.	Forelimb.	Hindlimb.	Tail.
		Length.	Width.				
A	88	8	6	22	11.5	14.5	47
B	77	7.5	5	21.5	13	15	39
C	77	7.5	5.5	20	12	14.5	39
D	66	7.5	5	18	12	15	34
*E	67	7	5	19	11	14	34
*F	47	7	4.5	20	11	14	10
*G	31	5.5	3.5	11.5	6.5	9	12

* Tail broken.

This species was found on Reevesby, Roxby and Stickney Islands, fairly common.

Recorded from the greater part of Australia.

ABLEPHARUS GREYII (Gray, 1845).

(Fig. 11.)

Menetia greyii Gray, 1845, *loc. cit.*, p. 66.*Ablepharus greyii* Boulenger, 1887, *loc. cit.*, p. 349.

Olive brown above, spotted with black, a narrow black stripe on each side; throat and lower jaw white spotted with black; venter white.

Specimen.	Length.	Head.		Body.	Forelimb.	Hindlimb.	Tail.
		Length.	Width.				
A	82	5	4	20.5	7.5	11	48

One specimen was found on Reevesby Island.

Recorded from the northern and southern parts of West Australia.

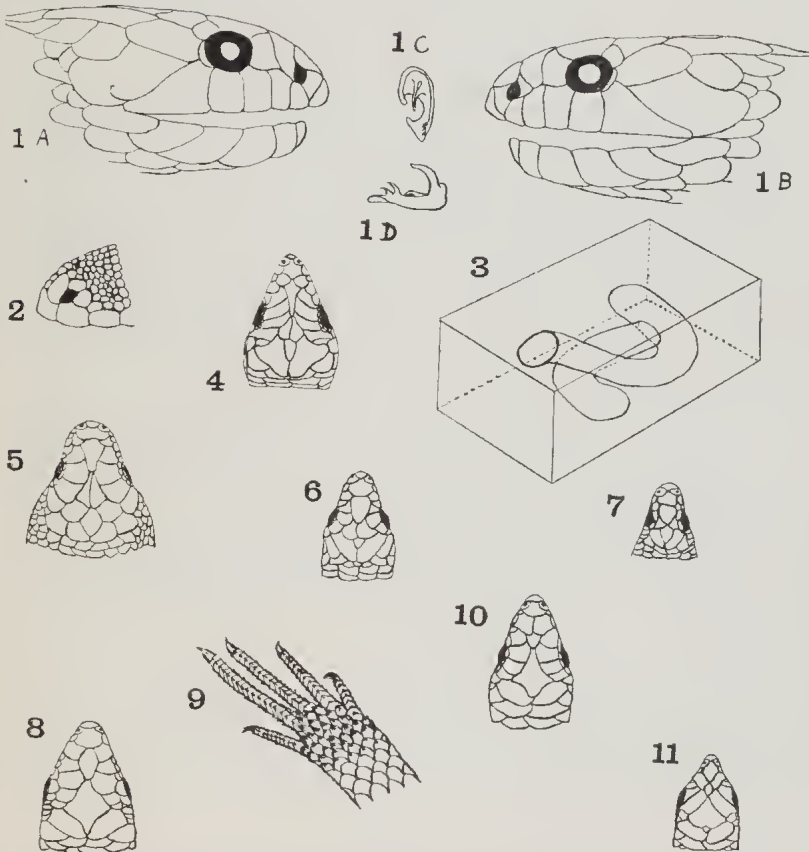


Fig. I.—1. *Notechis scutatus* var. *niger*. A. Head of Specimen E, from right side. B. Ditto, from left side. C. Left Maxilla from below. 4. Left Maxilla from left. 2. *Phyllodactylus marmoratus*. Snout, $\times 4\frac{1}{2}$. 3. Diagram of Burrow of the Reevesby Island *Varanus varius*. 4. *Sphenomorphus australis*. Head, $\times 2$. 5. *Hemiergis peronii*. Head, $\times 2$. 6. *Rhodona tetradactyla*. Head, $\times 2$. 7. *R. picturatum*. Head, $\times 2$. 8. *Ablepharus lineo-ocellatus*. Head, $\times 2$. 9. *A. taeniopleurus*. Right manus, $\times 3\frac{1}{2}$. 10. *A. boutonii* var. *peronii*. Head, $\times 2$. 11. *A. greyii*. Head, $\times 2$.

12. *Reptilia, Part 2; The Venom of Notechis scutatus variety niger, (Reevesby Island).*

By F. G. MORGAN, Director, Commonwealth Serum Laboratories, Melbourne.

The following notes on this venom are supplied at the request of the McCoy Society. Special attention has been paid in them to the toxicity of the venom and to the saving qualities of antivenene prepared for use against the Mainland Tiger snake in treating the bite of the Reevesby Island snake.

In the year 1934 we received several reports at the Commonwealth Serum Laboratories that death adders abounded in the Joseph Banks group of islands, and it was decided that Mr. T. E. Eades, of the staff of the Laboratories, should visit the locality to obtain death adders.

He visited Reevesby Island on the 8th to the 13th February, 1935. After a very careful search he was disappointed by being unable to find any trace of death adders, but acquired three good, living specimens of a handsome jet black snake. These snakes varied in length from 3 ft. 6 in. to 4 ft. 6 in. In appearance they do not resemble superficially the Mainland Tiger snake, nor the variety found on Chappell Island in the Bass Straits. The scalation, however, numerically resembled closely that of both other varieties.

These specimens were maintained in captivity for several months and "milked" for venom on numerous occasions.

From the three snakes, in sixteen "milking," 257 mg. of dried venom were obtained; the average yield per "milking" being 16 mg.

If Table I. be consulted it will be observed that the average yield per snake steadily diminished during successive periodical extractions of venom.

TABLE I.

Number of Snakes.					Date of Extraction.	Yield in Dried Venom.	Average per Snake.
3	..	..	..	..	12.3.35	103 mg.	34.3 mg.
3	..	..	..	..	2.4.35	44 "	14.7 "
3	..	..	..	..	23.4.35	40 "	13.3 "
3	..	..	..	..	24.5.35	24 "	8 "
2	..	..	..	..	30.7.35	} 54.4 "	13.6 "
2	..	..	..	..	27.8.35		
9	..	..	..	..	5.1.36		20.8 "

In January, 1937, the McCoy Society kindly supplied to us nine snakes from Reevesby Island, following their expedition to the Joseph Banks group. From these, 187 mg. of dried venom were obtained from one "milking" per snake. An average yield from this group was therefore 20.8 mg. These snakes varied in length from 18 inches to 4 ft. 6 in.

It is to be noted that the yield of venom from the first three snakes at the first "milking" averaged 34.3 mg.

The venom of these snakes, when dried, was glistening, pure white in colour and differed sharply in appearance from the rich yellow colour of the Chappell Island variety, and from the creamy-white colour of the Mainland Tiger snake venom. Obviously, individual snakes of the latter varieties occasionally yield venoms which are white in colour, but our experience is that dried pooled venoms from the latter invariably possess the above characters.

Table II. shows the result of testing for the lethal dose of the Reevesby Island snake venom for guinea-pigs, each weighing 300 grammes. All doses were administered in a constant volume for injection of 4 c.c.

TABLE II.—CERTAINLY LETHAL DOSE OF THE VENOM OF THE BLACK TIGER SNAKE (REEVESBY ISLAND, S.A.) FOLLOWING SUBCUTANEOUS INJECTION IN GUINEA-PIGS.

Number of Animals.	Dose in Mg. per 100 Gm. Body Wt.	Percentage Mortality.	Number of Animals Dying within Specified Periods.					Percentage Living After Fourteen Days.
			Less than 17 Hours.	17 to 48 Hours.	48 to 120 Hours.	120 to 240 Hours.	Living and Gaining Weight.	
1 ..	0.33	100	(d. 1 hr.)	..	..	..	..	..
1 ..	0.1	100	1	..	..	..	..	..
1 ..	0.033	100	1	..	..	..	..	..
1 ..	0.01	100	1	..	..	..	..	..
3 ..	0.0033	100	3	..	..	..	..	..
3 ..	0.002	100	..	3	..	..	..	..
10 ..	0.0015	100	..	8	..	2	..	..
10 ..	0.0013	100	..	9	1	..	..	..
20 ..	0.00116	100	..	12	4	4	..	..
20 ..	0.001	95	..	7	5	7	1	5
10 ..	0.00086	100	..	1	2	7	..	..
10 ..	0.00073	70	..	1	1	5	3	30
10 ..	0.0006	70	..	3	3	1	3	30
10 ..	0.00046	100	..	5	1	4	..	..
10 ..	0.00033	80	..	3	1	4	2	20

Weights of guinea-pigs were 300 gm. \pm 10 gm.

Large numbers of animals are necessary to determine accurately the certainly fatal dose for guinea-pigs of various ages and weights. At the time of testing only limited supplies were available, but Table II. indicates sufficiently clearly the degree of toxicity of this venom; thus it was found that a dose of 0.00087 mg. per 100 grammes given subcutaneously into 300 gramme guinea-pigs killed all members of that group. For all doses greater than that amount, 100 per cent. of pigs succumbed, with the exception of the group of 0.001 mg. per 100 grammes, in which one animal only survived, giving a 95 per cent. mortality.

The toxicity of this sample of Reevesby Island venom appears therefore to be nearly $2\frac{1}{3}$ times as potent as that of the average sample of Mainland tiger snake. C. H. Kellaway(1) has previously determined the certainly lethal dose for guinea-pigs subcutaneously of Mainland tiger venom as 0.002 mg. per 100 grammes.

As it has been claimed previously that the Australian Tiger snake (*Notechis scutatus*) yields a venom more potent than any other dried venom, weight for weight, it would appear that the venom of the Reevesby Island Black Tiger snake would displace the Mainland Tiger snake from this position. The toxicity of the venom of the other insular variety of tiger snake (*Notechis scutatus* var. *niger*, Chappel Island, Bass Strait) was determined by Kellaway and Thomson(2), when given subcutaneously, as 0.006 mg. per 100 grammes.

We have as yet had no opportunity of determining the intravenous certainly fatal dose of the Reevesby Island venom, nor, consequently, the subcutaneous-intravenous index.

When making these observations it was our object rather to determine the saving qualities of Mainland tiger snake antivenene against Reevesby Island snake venom, than to conduct detailed investigation of the nature of the venom.

Table III. shows the protective effect of monovalent Mainland Tiger antivenene against both Reevesby Island and Mainland snake venoms.

The test dose of venom for each guinea-pig weighing 300 grammes was 0.06 mg. This quantity of venom is equal to 10 certainly fatal doses of the Mainland venom, and 23 certainly fatal doses of Reevesby Island venom. In the case of the former venom, 0.2 c.c. of serum saved both pigs against the test dose, and 0.16 c.c. saved one pig out of two; the other dying after a relatively prolonged period, namely 120 hours.

In the case of the Reevesby Island venom, 0.25 c.c. of antivenene saved both pigs, and 0.2 c.c. saved one; the other dying after 96 hours. All doses of this test were made up to a total volume of 4 c.c. and injected subcutaneously.

TABLE III.—PROTECTIVE EFFECT OF MONOVALENT MAINLAND TIGER ANTIVENENE.

Pig Number.	Date.	Type of Venom.	Dose of Venom (mg.).	Dose of Antivenene 2624.	Result.
14	18.11.36	Black tiger, Reevesby Is.	0.06	0.5 cc.	Lived
15	18.11.36	" " "	0.06	0.5 "	Lived
16	18.11.36	" " "	0.06	0.33 "	Lived
17	18.11.36	" " "	0.06	0.33 "	Lived
18	18.11.36	" " "	0.06	0.25 "	Lived
19	18.11.36	" " "	0.06	0.25 "	Lived
20	18.11.36	" " "	0.06	0.2 "	Died 96 hours
21	18.11.36	" " "	0.06	0.2 "	Lived
22	18.11.36	" " "	0.06	0.166 "	Died 48-72 hours
23	18.11.36	" " "	0.06	0.166 "	Died 48-72 hours
24	23.11.36	Mainland tiger snake ..	0.06	0.25 cc.	Lived
25	23.11.36	" " " "	0.06	0.25 "	Lived
26	23.11.36	" " " "	0.06	0.20 "	Lived
27	23.11.36	" " " "	0.06	0.20 "	Lived
28	23.11.36	" " " "	0.06	0.16 "	Died 120 hours
29	23.11.36	" " " "	0.06	0.16 "	Lived
30	23.11.36	" " " "	0.06	0.125 "	Died 24-40 hours
31	23.11.36	" " " "	0.06	0.125 "	Died 24-40 hours
32	23.11.36	" " " "	0.06	0.1 "	Died in less than 16 hours
33	23.11.36	" " " "	0.06	0.1 "	Died in less than 16 hours
34	23.11.36	" " " "	0.006	..	Lived
35	23.11.36	" " " "	0.0075	..	Lived
36	25.11.36	" " " "	0.006	..	Died in less than 22 hours
37	25.11.36	" " " "	0.0075	..	Died in less than 22 hours
38	25.11.36	" " " "	0.0094	..	Died in less than 22 hours
39	25.11.36	" " " "	0.012	..	Died in less than 22 hours

It can be assumed that in pigs 20 and 21 there was barely one fatal dose left unneutralized; therefore 0.2 c.c. of antivenene saved against 22 fatal doses, or a weight of 0.06 minus 0.0026 mg. of Reevesby Island venom. 1 c.c. of antivenene is therefore calculated to neutralize 0.287 mg. of this venom.

By the same method of calculation the same antivenene in a dose of 0.16 c.c. neutralizes nine fatal doses of venom, or 0.06 minus 0.006 mg. of Mainland venom. 1 c.c. of antivenene thus neutralizes 0.3375 mg. of Mainland venom.

If we consider these results from the viewpoint of the amount of dried venom of each species which the antivenene is capable of neutralizing, then it would appear that the Mainland tiger antivenene is slightly more potent against the homologous Mainland tiger venom, but the difference is small and within the limits of spacing of doses.

If we consider the effectiveness of neutralization by the antivenene in terms of certainly fatal doses of each venom, then a difference is apparent in favour of neutralization of Reevesby Island venom. In other words, 1 c.c. of antivenene is capable of

neutralizing 110.4 certainly fatal doses of Reevesby Island venom, whereas it will neutralize 56.25 certainly fatal doses of Mainland tiger venom.

In treating a case of snakebite it is always very difficult to assess the probable amount of venom which the snake injected into the tissues, owing to the possibility of variation in the size of the snake, the locality bitten, the presence of clothing and several other circumstances which may hamper the effectiveness of the bite. We can assume safely that it is very seldom, if ever, that a snake will inject at one bite the whole of the venom available in its glands. Data obtained by Fairley and Splatt(3) for repeated spontaneous bites upon rubber diaphragms show that such is the case, the amount of venom ejected diminishing with each successive bite. If we take into consideration the amount of venom available in the glands of each variety of snake, and allow an ample excess of antivenene to neutralize the average yield obtained at each "milking" under laboratory conditions, then the practical result will, in the great majority of cases, be favorable. Thus, 34.3 mg. of dried venom was the average obtained from the first "milking" of three Reevesby Island tiger snakes (Table I.) and 50 mg. was the average per snake from a representative collection of Mainland tiger snakes. One hundred and twenty c.c. of the Mainland tiger antivenene, Batch No. 2624, would be required to neutralize 34.3 mg. of dried venom of the Reevesby Island variety. One hundred and forty-eight c.c. of the same serum would be required to neutralize 50 mg. of Mainland tiger venom.

It can be seen that the use of Mainland tiger monovalent antivenene is strongly indicated, following a bite by the Reevesby Island snake. Similar dosage should be employed. Owing to the smaller amount of venom which, in all probability, would be injected on the average by the latter snake, the outcome of treatment by the antivenene may be, on the average, more favorable to the patient.

References.

1. KELLAWAY, C. H., 1929, *Med. J. of Aust.*, i., p. 353.
2. ———, C. H., and D. F. THOMSON, 1932, *Aust. Jour. Exp. Biol. & Med. Sci.*, x., p. 41.
3. FAIRLEY, N. H., and B. SPLATT, 1929, *Med. J. of Aust.*, i., p. 336.

13. *Aves.*

Compiled from the field notes of FREDERIC WOOD JONES, H. CONDON, G. MACK, J. F. RUTTER, and J. A. TUBB.

1. *EUDYPTULA MINOR NOVAEHOLLANDIAE* (Stephens)—Little Penguin.

Spheniscus novae-hollandiae Stephens, Shaw's Gen. Zool., xiii., 1826, p. 68.

The Little Penguin was present on all the islands of the group. The breeding season was over; but young birds of the year were still present in breeding burrows on Reevesby and probably on other islands. The nesting sites varied greatly on the different islands. On Little English Island the birds were all living in deep crevices between the granite boulders. It is possible that this choice of nesting sites was dictated by the presence of the colony of seals on the island; since during their breeding season the seals live largely on penguins. On the more sand-covered islands, such as Blyth, deep nesting burrows were excavated among the tangle of *Nitraria* bushes; and on the islands that carry a travertine capping they breed in the deep recesses weathered beneath the ledges of travertine along the coastline.

(Skin ♂ Reevesby, Nat. Mus., Melbourne.)

2. *COTURNIX PECTORALIS* Gould—Stubble Quail.

Coturnix pectoralis Gould, Syn. Birds Aust., pt. 2, 1837, pl. 29, fig. 1.

Quail were seen in small numbers on Reevesby, Winceby, Hareby, Spilsby, and Duffield Islands. A clutch of four eggs was found on Winceby.

(Skins ♂ ♀ Reevesby, Nat. Mus. Melbourne.)

3. *RALLUS PHILIPPENSIS AUSTRALIS* (Pelzeln)—Banded Landrail.

Hypotaenidia australis Pelzeln, Ibis, 1873, p. 42.

An adult bird was first seen on Winceby Island, but the identity of the species was not fully established until a dead and partly decomposed immature specimen was found in a well on Reevesby. Subsequently an adult was frequently seen searching for the remains of food thrown out on the camp dump. The species was unknown to the tenant of the Reevesby homestead, and it has evidently not taken to eating the eggs of the domestic poultry as it has on some other islands (e.g. Maetsuyker) on which it has gained a footing.

(No specimen procured.)

4. PELAGODROMA MARINA DULCIAE Mathews—White-faced Storm Petrel.

Pelagodroma marina dulciae Mathews, Birds of Aust., ii., 1912, p. 21.

Upon every island of the group, with the exception of the rocky Little English Island and Spilsby, the storm petrels were breeding in thousands. Spilsby is a large island, and it is possible that some small breeding area upon it may have been overlooked, but the prolonged occupation with the consequent effects of cultivation and the introduction of sheep and rabbits have evidently combined to render the island unsuitable as a petrel rookery.

On 6th December, the large rookery on the southern end of Reevesby was examined and eggs, ranging from new-laid to those containing large embryos, were found. All the birds incubating the eggs on that date proved to be males. No female bird was found incubating until a single female was discovered on 11th December, and several were observed on 23rd December, when the first newly-hatched young was met with. On Reevesby the breeding area is confined to the red-soil, salt-bush area at the southern end of the island; on the very similar area at the northern end there was not a single burrow. The colony is a large one. The burrows are all made around the clumps of vegetation, and are usually long and extremely tortuous. It is a remarkable thing that so feeble-looking a bird can manage to drive its tunnels into the rather hard red soil on Reevesby. The tunnels twist about in all directions, for when the bird encounters a hard piece of travertine it attempts to go round it and, if that is impossible strikes off in another direction. In this way many of the burrows become forked and complicated by side tunnels and loops. One burrow that was carefully excavated had three entrances and two nesting chambers; one was occupied by a bird and the other contained one egg.

In one complicated burrow excavated on 8th December, a male bird was found sitting on two eggs—the only instance in which two eggs were found in one nest. It is probable that these complicated burrows are caused by an excavating bird striking a burrow originally made by another bird and finally taking possession of the whole system; but two birds were never found in the same burrow, however complicated. Upon the islands, such as Blyth, where the soil consists entirely of loose sand, the burrows are made amidst the roots of the *Nitraria* bushes. So large are the holes and so much sand is piled about the entrances that, without opening a burrow, it is difficult to believe that they are the work of so small a bird. The first impression is that some much larger petrel, or even a Mutton Bird, must be responsible for the burrows. On certain islands of the group, such as Langton, the surface is so extensively mined by the birds that it is almost impossible to walk even a few yards without breaking into the burrow of some unfortunate bird. For the most part

the birds are silent during the daytime, but, on occasions, large areas of a rookery will become vocal with the little grunting coos of the sitting birds.

The chief enemies of the petrels on Reevesby are the numerous black tiger snakes, which at the time of our visit were living on the adult birds. Snakes killed as they lay outside the burrows early in the morning almost invariably contained an adult petrel only partly digested. Two snakes killed on one small area each contained a petrel; in the one the bird lay in the stomach with its head lowest, and in the other the position was reversed. Judging from the numbers of the snakes and their extreme fatness, they must take heavy toll of the birds during their stay on the islands. On all the islands upon which colonies of breeding birds are established the Pacific Gulls, most murderous of birds, secure their victims; and on certain islands they are preyed on by hawks. It is much to be regretted that goats have been turned down on Sibsey, for their trampling of the burrows is endangering the petrel colony. Besides the rock parrots, which seem to use the petrel's burrows before their rightful owners occupy them, a cricket (*Necomobius* sp.) was almost invariably present in the burrows. The cricket is an insect that lives in dark places, and so probably only uses the petrels' burrows as safe retreat; but the birds appeared in no way to resent their presence, even when half a dozen crickets occupied the nesting chamber.

The breeding season would seem to be prolonged and somewhat irregular. Fresh eggs have been found from 19th November to 31st December; newly-hatched young from 23rd December to 20th February, and the earliest date on which young were noted as having left the nest was 24th February. The newly-hatched chick is covered with a fine grey down, with the exception of the region round the eye, the base of the bill and the throat, which are bare. The first plumage is identical with that of the adult, the down being gradually shed until only a few stray down feathers adhere to the tail coverts when the bird is ready to leave the nest. The parents leave the young by day from the moment of its hatching.

The average measurements of sixteen eggs from Reevesby Island are 35.8 x 25.7 mm. The maximum measurements are 38 x 26, and 37 x 26.5. The minimum measurements 34.5 x 26, and 36.5 x 24.5. Of these sixteen eggs, six are without any trace of markings, nine show a very few and almost microscopic brown specks at the larger end, and one shows fairly large brown dots instead of the minute specks. Only on one occasion was a bird found sitting on two eggs, and these eggs were identical in measurements (36 x 26), and were similarly speckled.

The average measurements of incubating males from Reevesby, taken during December, 1936, are as follows:—Wing, 155.3 mm.; Tarsus, 42.3; bill, 16.6 x 7.

For young ♂ birds in adult plumage, but with down still adhering to the tail coverts, from Reevesby, taken in February, 1936:—Wing, 133.7 mm.; tarsus, 38.7; bill, 16.5 x 6.5.

(Skins ♂ ♂ ♀ Reevesby, Nat. Mus. Melb. ♂ ♂ ♂ ♀ Reevesby, S.A. Mus.)

5. *Puffinus carneipes* Gould—Fleshy-footed Shearwater.

Puffinus carneipes Gould, Ann. Mag. Nat. Hist., xiii., 1844, p. 365.

Two decomposed birds were found on the beaches. The condition of the soft parts was sufficiently good to make the specific diagnosis quite certain. It is a remarkable fact that two of these unfamiliar shearwaters should be found on islands in Spencer Gulf in the entire absence of any remains of *P. tenuirostris* whose breeding grounds (on the Althorps and Neptunes) are so near at hand.

6. *Phalacrocorax sulcirostris* Brandt—Little Black Cormorant.

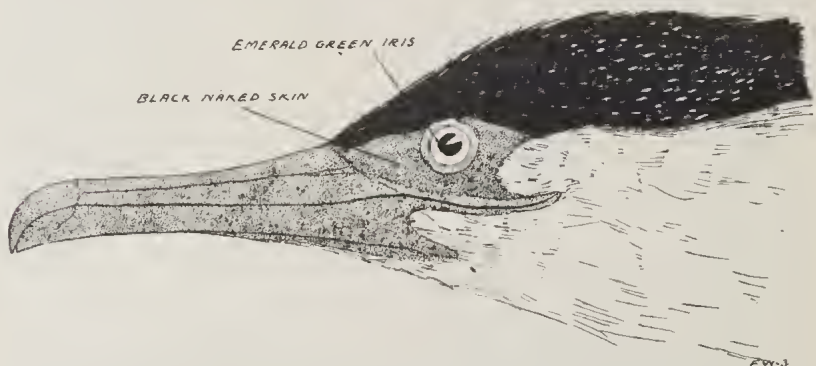
Carbo sulcirostris Brandt, Bull. Sci. Imp. Acad. Sci. St. Petersb., iii., 1837, col. 56.

Seen only on the rocks lying off Marum Island. Some half dozen birds were present (13th December) among a much larger number of *P. fuscescens*.

7. *Phalacrocorax fuscescens* (Vieillot)—Black-faced Cormorant.

Hydrocorax fuscescens Vieillot, Nouv. Dict. Hist. Nat., viii., 1817, p. 86.

Common on the shores of all the islands. The birds had not begun to lay in their rookery on Winceby by the time the party



P. FUSCESCENS. ADULT ♂ BREEDING SEASON.

left the islands. (On Winceby fresh eggs, and newly-hatched young were present in the nests on 20th February, 1936). All the nests of *P. fuscescens* were placed upon the ground, often raised to some little height by masses of fish bones, and debris of all sorts. No trace of purple was present on the faces of birds either during the breeding period or in the months immediately preceding it.

The average measurements of fifteen eggs from Winceby is 56.6 x 35.9. The maximum measurements being 61 x 36 and 55 x 38, and the minimum 49 x 34 and 55 x 33.

(Skins ♂♂♂♀♀ Reevesby, Nat. Mus. Melb. ♀♀♀ S.A. Mus.)

8. PHALACROCORAX VARIUS (Gmelin)—Yellow-faced Cormorant.

Pelecanus varius Gmelin, Syst. Nat. i., pt. 2, 1789, p. 576.

In the early days of December *P. varius* was present in very small numbers, probably being in a proportion of less than one to fifty *P. fuscescens*; but in January their numbers increased, and on Winceby, on which is situated their largest rookery, they were present in perhaps the ratio of one to ten *P. fuscescens*. *P. varius* is easily recognized in a mixed company of *P. varius* and *P. fuscescens* by its being a larger bird, and by its habit of sitting considerably more erect. On Winceby Island all the nests of this species are elevated on the tops of the low nitraria bushes which are scattered over the general area in which *P. fuscescens* is nesting on the ground.

Average measurements of nineteen eggs from Winceby is 59.9 x 38.8. The maximum measurements being 65 x 37 and 62 x 41, and the minimum 57 x 38 and 58 x 37.

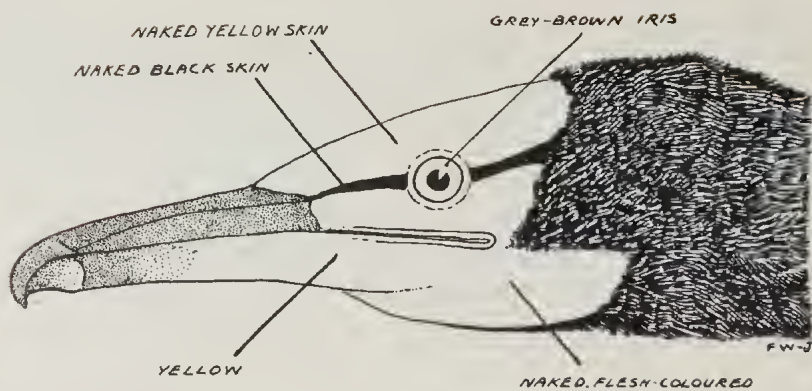
9. MICROCARBO MELANOLEUCUS MELANOLEUCUS (Vieillot)—Little Pied Cormorant.

Hydrocorax melanoleucos Vieillot, Nouv. Dict. Hist. Nat., viii., 1817, p. 86.

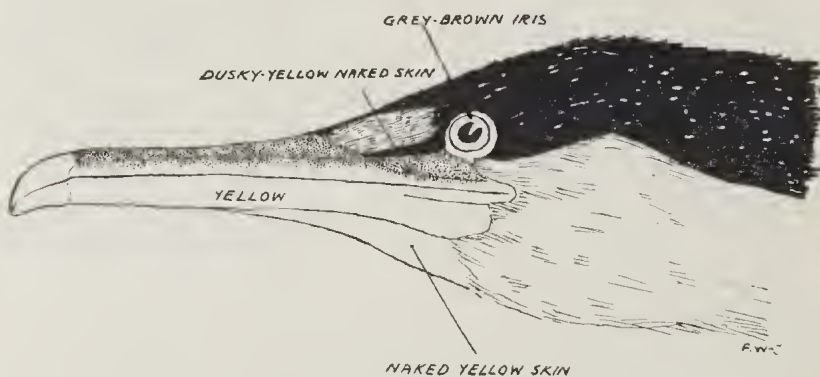
This bird was seen only on Roxby Island, where there was a small rookery containing five nests. The little breeding colony had taken up its position on a small rocky peninsular only some 20 yards across at its widest part. One young bird was not quite able to fly, one young bird was secured flying at sea, and the other nests contained fresh eggs. The number of eggs in each nest varied from two to four.

The average measurements of six eggs from Roxby is 45.8 x 28.8. The maximum being 48 x 31 and the minimum 44 x 27.

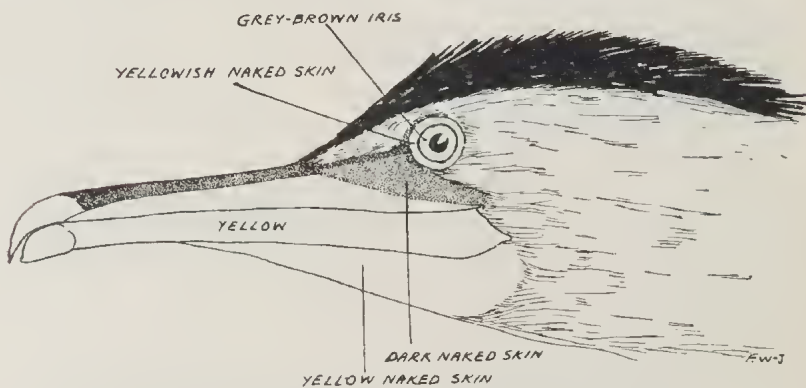
(Skins ♀ ad. ♂ young adult. ♂ inv. Roxby, Nat. Mus. Melb.)



M. MELANOLEUCUS. YOUNG ♂ IN ALL-BLACK DOWN
FIG. 2.



M. MELANOLEUCUS. IMMATURE ♂
FIG. 3.



M. MELANOLEUCUS. ADULT BREEDING ♀
FIG. 4.

10. HYDROPROGNE CASPIA STRENUA (Gould).—Caspian Tern.

Sylochelidon strenua Gould, Proc. Zool. Soc. 1846, p. 21.

Caspian Terns were found breeding on Winceby, Bligh, Kirkby, Lusby, Roxby, and Partney. Unlike the other breeding terns, the Caspians breed in isolation and, at the most, three pairs were found breeding on one island (Kirkby). Fresh eggs were found on Winceby and Partney, downy young on Lusby, and young birds nearly able to fly on Bligh and Kirkby.

(Skins ♂ ♀ Winceby. Nat. Mus., Melb.)

11. THALASSEUS BERGII CRISTATUS (Stephens).—Crested Tern.

Sterna cristata Stephens, Shaw's Gen. Zool., xiii., 1826, p. 146.

Two nesting colonies were watched and photographed, the larger colony being on Kirkby and the smaller on Winceby. On Hareby a number of birds were observed courting and mating, but no breeding colony was established on the island at the time of our visit (20th December). On Winceby the eggs had only recently been laid (10th December), and on Kirkby (26th December) the young birds were just hatching. The whole process of the nesting operations up to the time of the parent birds conducting the young to the sea was observed and recorded by cinematograph. It is a remarkable thing that the newly hatched birds swim as readily as gulls and that, on occasion during the initiation of the young birds, the parents will alight on the water and swim. The curious drooping ("elbowing") of the wings, which has been described as an antic of courtship in some species, is maintained by the parent birds all through the breeding season, and is especially pronounced during the time of initiation of the young.

(Skins ♂ ♂ Five eggs. Winceby. Nat. Mus., Melb. ♂ Three eggs. S.A. Mus.)

12. STERNA NEREIS NEREIS (Gould).—Fairy Tern.

Sternula nereis Gould, Proc. Zool. Soc., 1842 (1843), p. 140.

Fairy terns were observed fishing around all the islands and large breeding colonies were present on Kirkby, Langton, and Stickney. The eggs were mostly fresh on Christmas Day, but the young were hatched before the camp was abandoned. The clutch consisted, as a rule, of two eggs, but in a few instances three were present in one nest.

(Skins ♂ ♀ Reevesby. Nat. Mus., Melb. ♂ Reevesby. S.A. Mus.)

13. *LARUS NOVAE-HOLLANDIAE NOVAE-HOLLANDIAE* * Stephens.—
Silver Gull.

Larus novae-hollandiae Stephens, Shaw's Gen. Zool., xiii., 1826, p. 196.

Silver gulls were not numerous about the islands until the end of December. Apparently they have no breeding station in the group, and their added numbers in January—especially on Winceby Island—is almost certainly in anticipation of the commencing incubation of the shags, since during the second week of February, when the breeding season of the shags is at its height, the gulls are present in large numbers. The moment an incubating shag is disturbed and leaves its eggs unprotected the silver gulls crowd round and eat the eggs, or if they happen to be hatched, the young birds.

(Skins ♀ Reevesby. Nat. Mus., Melb. ♂ S.A. Mus.)

14. *GABIANUS PACIFICUS* (Latham).—Pacific Gull.

Larus pacificus Latham, Ind. Orn. Suppl., 1801, p. 68.

The black-backed gull was to be observed on the shores of all the islands, and evidently they breed, as is their habit, as isolated pairs on many of the islands. An abandoned egg was found on Reevesby, and two were present in a deserted nest on Marum. Several immature birds in the brown phase were present. The adult bird, during life, has the breast feathers and the under wing coverts suffused with a very beautiful delicate pinkish-yellow colour: this colour is, however, evanescent and fades in the dried preserved skin.

(Skins ♂♂ ad Reevesby. ♂ imat. Winceby. Nat. Mus., Melb. ♂ ♀ S.A. Mus.)

15. *ARENARIA INTERPRES INTERPRES* (Linnaeus).—Turnstone.

Tringa interpres Linnaeus, Syst. Nat., i., 1758, p. 148.

Present in little flocks of from two or three up to ten or so on the shores of most of the islands. As a rule they were in common flocks composed of little stints and red-capped dotterels, but they differ from these small waders in usually feeding further from the shore, on rocky promontories, or at the end of sand spits. When flushed with a common flock of waders, the turnstones as a rule dissociate themselves from the dotterels and other species by flying further out to sea. The dotterels and stints usually fly parallel to the water's edge, and settle on the sand not very far from the spot whence they were flushed; but turnstones fly to sea and, coming round in a wide arc, land far from their point of departure. Though not easy to recognize in a mixed feeding flock at any great distance they are easily identified when on the wing.

(Skins ♂ ♀ ♀ Reevesby. ♂ Spilsby, Nat. Mus., Melb.)

16. HAEMATOPUS OSTRALEGUS LONGIROSTRIS Vieillot.—Pied Oyster-catcher.

Haematopus longirostris Vieillot, Nouv. Dict. Hist. Nat., xv., 1817, p. 410.

Usually seen singly or in pairs and present on the shores of most of the islands, these birds were far less numerous than the sooty oyster-catchers. They were also far more wary, and usually took fright from the beach if they were approached within from 80 to 100 yards. Again, unlike the all black birds, they were frequently seen among the sand hills at the top of the beach as though in the neighbourhood of their eggs, but no nest was found.

(Skin ♂ Reevesby. Nat. Mus., Melb.)

17. HAEMATOPUS FULIGINOSUS Gould.—Sooty Oyster-catcher.

Haematopus fuliginosus Gould, Birds of Aust., iv., 1845, pl. 8.

Common on all the islands, and usually seen in small parties or pairs on the more rocky parts of the coast. Two adult birds captured by dazzling them with electric torches at night, showed a curious difference in the length of their bills: for whilst the bill of one was 90 mm., that of the other was only 74 mm. Moreover, the longer bill was distinctly paler and more yellow than the shorter bill. These birds were kept for some days, and fed readily on crushed winkles. They were liberated before the camp broke up, and their sex was not determined. One abandoned egg was found on Reevesby—measurements, 65 x 42 mm.

(Skins ♂ ♂ Reevesby, Nat. Mus., Melb. ♂ S.A. Mus.)

18. LOBIBYNX NOVAE-HOLLANDIAE (Stephens).—Spur-winged Plover.

Vanellus novae-hollandiae Stephens, Shaw's Gen. Zool., xi., 1819, p. 516.

Small parties were present on most of the islands. In the early morning they were mostly to be seen along the sand flats, but they were usually to be found in the stubble on Reevesby, and on the higher parts of most of the islands. As is usual, they were readily alarmed and difficult to approach.

(Skin ♂ Winceby, Nat. Mus., Melb.)

19. ZONIFER TRICOLOR (Vieillot).—Banded Plover.

Charadrius tricolor Vieillot, Nouv. Dict. Hist. Nat., xxvii., 1818, p. 147.

Only a few were seen, usually in company with the Spur-winged Plover in the stubble near the homestead on Reevesby. No specimens were obtained, but an abandoned egg (measurements 43 x 32 mm.) was picked up on Reevesby.

20. *PLUVIALIS DOMINICA FULVA* (Gmelin).—Golden Plover.

Charadrius fulvus Gmelin, Syst. Nat., i., 1789, p. 687.

A specimen was secured on Partney Island, and other birds believed to be of this species were seen singly or in pairs feeding far out on rocky flats on other islands, but they were excessively wary and difficult to observe at anything like close range.

(Skin ♂ Partney, Nat. Mus., Melb.)

21. *CHARADRIUS RUBRICOLLIS* Gmelin.—Hooded Dotterel.

Charadrius rubricollis Gmelin, Syst. Nat., i., 1789, p. 687.

Mostly seen in pairs running on the sandy beaches of Reevesby, but also observed on Lusby and some other islands in the group.

(Skin ♂ Reevesby, Nat. Mus., Melb.)

22. *CHARADRIUS ALEXANDRINUS RUFICAPILLUS* Temminck.—Red-capped Dotterel.

Charadrius ruficapillus Temminck, Pl. Col. d'Ois. i., 1821, pl. 47.

Far more abundant than the hooded dotterel, little parties were observed on the sandy beaches of practically all the islands. Adult and young birds were captured by dazzling them with electric torches on the beach at night. The young were still in the down during December.

(Skins ♂ ♂ ♀ ♀ Reevesby, Nat. Mus., Melb. ♂ S.A. Mus.)

23. *NUMENIUS MADAGASCARIENSIS* (Linnaeus).—Curlew.

Scolopax madagascariensis Linnaeus, Syst. Nat., ed. 12, i., 1766, p. 242.

Of these birds solitary individuals were seen on most of the islands. As a rule they fed far out at the extremity of rocky flats, and were exceptionally wary and difficult to approach. Only on Reevesby were two birds ever observed to be feeding in company.

(No specimen was procured.)

24. *TRINGA NEBULARIA* (Gunnerus).—Greenshank.

Scolopax nebularia Gunnerus, in Leem, Beskr. Finn. Lapper, 1766, p. 251.

On Reevesby two of these birds were watched feeding in a mixed flock of dotterels and stints. It was noticed that they usually took up a station seaward of the smaller waders and that their movements were much less brisk during their feeding operations. For long intervals they would remain immobile while the dotterels and stints showed their usual little fits and starts of activity. Others were observed on a sand spit on Hareby, also in a flock of mixed waders. Solitary individuals were seen on most of the islands.

(Skins ♂ Reevesby. ♂ Spilsby. Nat. Mus., Melb.)

25. *EROLIA RUFICOLLIS* (Pallas).—Little Stint.

Trynga ruficollis Pallas, Reise versch. Prov. Russ. Reichs, iii., 1776, p. 700.

The little stint was observed on practically every island. At times it was in little flocks of from a dozen to twenty individuals, and at times it formed part of mixed flocks, one or two being present with dotterels and turnstones in a common feeding party. When flushed with a mixed flock, the stints usually manoeuvre with the dotterels, and fly down the beach parallel with the tide line.

(Skins ♂ ♂ ♀ ♀ Reevesby, ♂ ♀ ♀ Hareby, Nat. Mus., Melb. ♂ ♂ S. A. Mus.)

26. *EROLIA ACUMINATA* (Horsfield).—Sharp-tailed Sandpiper.

Totanus acuminatus Horsfield, Trans. Linn. Soc. Lond., xiii., 1821, p. 192.

A single specimen, one of a pair flushed from the beach, was obtained on Hareby Island.

(Skin ♂ Hareby, Nat. Mus., Melb.)

27. *BURHINUS MAGNIROSTRIS* (Latham).—Stone Curlew.

Charadrius magnirostris Latham, Ind. Orn. Suppl., 1801, p. 66.

As usual this bird was more often heard than seen. Every night they were heard passing over the camp, but by day time they were only seen when by chance a squatting bird was flushed in the sand hills. One bird was captured by dazzling it with an electric torch and, after being photographed, was released. A deserted clutch of two eggs was found on Reevesby.

(Skins ♂ Reevesby, ♂ Marum; Nat. Mus. Melb. ♀ S.A. Mus.)

28. *PLEGADIS FALCINELLUS PEREGRINUS* (Bonaparte).—Glossy Ibis.

Ibis peregrina Bonaparte, Consp. Av., ii., 1855, p. 159.

A pair of these birds was seen flying low over the party camped on the beach of Spilsby (21st December, 1936), and next day, on landing on Little Spilsby, three birds were observed standing on the highest point of the island. On being disturbed they flew towards Spilsby Island, and appeared to land on its southern end.

29. *NOTOPHOYX NOVAE-HOLLANDIE* (Latham).—White-faced Heron.

Ardea novae-hollandiae Latham, Ind. Orn., ii., 1790, p. 701.

Solitary birds or pairs were seen on the majority of the islands, usually standing at the seaward end of reefs. They were, however, excessively shy.

30. CEREOPSIS NOVAE-HOLLANDIAE Latham.—Cape Barren Goose.

Cereopsis novae-hollandiae Latham, Ind. Orn. Suppl., 1801, p. 67.

It is not so long ago that the Banks Group was the most important breeding station of Cape Barren Geese in South Australia. The South Australian Pilot calls attention to the abundance of geese in the group, and within the memory of people living in the neighbourhood geese have swarmed on the islands. To-day their numbers are sadly diminished. A party of from eight to ten was generally to be seen in the stubble near the Reevesby homestead, and birds were seen in twos and threes on several other islands; but it was impossible to arrive at any precise estimate of the total numbers since the birds fly freely from island to island. The islands were very dry during the visit of the members of the Society, and the geese appeared to be subsisting mostly on the pigface and the sprouts of oats appearing among the stubble. It would seem that, unless a vigorous protection policy is undertaken, the raids carried out by parties from the mainland will, in a very short while, exterminate the Cape Barren geese of the Banks Group. One young bird was captured and presented to the Flora and Fauna Board of South Australia for liberation on the reserve of Flinders Chase; and one young adult, after having been cinematographed, was secured as a specimen.

(Skin ♂ inv. Kirkby, Nat. Mus., Melb.)

31. CHENOPIS ATRATA (Latham).—Black Swan.

Anas atrata Latham, Ind. Orn. ii., 1790, p. 834.

Four birds were observed (by H.T.C.) passing eastwards over Reevesby Island on 10th December.

32. ANAS SUPERCILIOSA ROGERSI Mathews.—Grey Duck.

Anas superciliosa rogersi Mathews, Aust. Av. Rec., i., 1912, p. 33.

A pair seen on the dam on Spilsby and a party of four on the shore of Roxby Island.

33. HALIAEËTUS LEUCOGASTER (Gmelin).—White-breasted Sea Eagle.

Falco leucogaster Gmelin, Syst. Nat., i., 1788, p. 257.

It is rather remarkable that only one example of the Sea Eagle was observed in the group. The solitary bird was first seen on a rocky cliff in Spilsby, and when alarmed it flew towards the centre of the island. Unfortunately no information about the birds breeding on the island was obtained from the occupants of the homestead.

34. *FALCO CENCHROIDES* Vigors and Horsfield.—Kestrel.

Falco cenchroides Vigors and Horsfield, Trans. Linn. Soc. Lond., xv., 1827, p. 183.

Only one pair of birds, with, in some instances, the grown young of the year, was present on each island. Reevesby, Wineby, Marum, and Partney, each had a pair of birds, and on Reevesby the full grown young of the year were accompanying their parents. On Wineby the birds make a nest on the ground in a corner of the lighthouse enclosure.

(Skin ♂ Partney, Nat. Mus., Melb.)

35. *KAKATOË ROSEICAPILLA* (Vieillot).—Galah.

Cacatua roseicapilla Vieillot, Nouv. Dict. Hist. Nat., xvii., 1817, p. 12.

A large flock visited Reevesby Island and settled in the stubble fields near the homestead; later in the same day (24th December) scattered birds were seen in various parts of the island, but all seemed to have left before nightfall.

36. *NEOPHEMA PETROPHILA* (Gould).—Rock Parrot.

Euphema petrophila Gould, Proc. Zool. Soc., 1840, p. 148.

The beautiful little Rock Parrot is abundant in all the islands. At the time of the visit of the Society the breeding season was evidently over as birds of the year were indistinguishable from their parents, and the genital glands of all specimens procured were in the resting phase. Although at times it was thought that birds were seen to disappear into a petrel's burrow only one parrot was actually dug out (Wineby), and this bird had no egg or young one in the nesting chamber. On a previous visit (20th February, 1936) a parrot was found with a fresh egg in the nesting chamber of a petrel's burrow, and it would seem probable that they normally use the petrels' burrows before the rightful owners' usual breeding season. This point could only be determined by examining a series of burrows in September. It is usually said that the eggs are deposited under ledges of travertine; but though numerous travertine caves and ledges were examined no trace of former occupancy was detected. A single abandoned egg lying out in the open (26 x 20) was picked up on Reevesby.

The birds feed on the seeds of *Mesembryanthemum*, and upon the berries of *Myoporum insulare*.

The plumage about the face is frequently stained magenta red from the juices of the berries on which they feed. Upon the plumage of one bird a dipterous parasite (Hippoboscidae) was present.

(Skins ♂ ♂ ♀ Reevesby, Nat. Mus., Melb. ♀ ♀ S.A. Mus.)

37. *HIRUNDO TAHITICA NEOXENA* Gould.—Welcome Swallow.

Hirundo neoxena Gould, Birds of Aust., ii., 1842, pl. 13.

Swallows were seen about most of the islands, and were often to be observed sitting on the rocks or actually on the seashore at low tide. A pair was usually hawking over the bush in the neighbourhood of the camp.

(Skin ♀ Reevesby, Nat. Mus., Melb. ♂ S.A. Mus.)

38. *GRALLINA CYANOLEUCA* (Latham).—Magpie Lark.

Corvus cyanoleucus Latham, Ind. Orn. Suppl., 1801, p. 25.

A female bird was seen around the camp for a few days in January. It was not observed after 8th January.

39. *EPHIANURA ALBIFRONS* (Jardine and Selby).—White-fronted Chat.

Acanthiza albifrons Jardine and Selby, Illus. Orn., ii., 1828, pl. 56.

Abundant on all the islands. Usually to be seen in the early morning on saltbush along the shore, or even on beds of seaweed still washed by the waves. Little parties were frequently seen among the rocks at low tide, and at all times it was to be found in the more open parts of the islands.

(Skins ♂ ♀ Reevesby, Nat. Mus. Melb.)

40. *MEGALURUS GRAMINEUS GRAMINEUS* (Gould).—Little Grassbird.

Sphenoeacus gramineus Gould, Proc. Zool. Soc., 1845, p. 19.

The note of this bird was heard daily in the neighbourhood of the camp on Reevesby for more than a month before any member of the party actually saw an individual. The quiet observation of bush birds was rendered difficult by the constant irritation of flies, since it was impossible to remain still for any prolonged interval; nevertheless hours were spent in attempting to localize the birds producing the constantly repeated notes. Some disused nests, possibly of this species were found on Reevesby and Winceby.

(Skin ♂ Winceby; Spirit specimen, Reevesby, Nat. Mus., Melb.)

41. *ARTAMUS CYANOPTERUS* (Latham).—Dusky Wood Swallow.

Loria cyanoptera Latham, Ind. Orn. Suppl., 1801, p. 46.

Seen only on Spilsby Island, where it was by no means uncommon among the casurinas. It was even noticed sitting on the fence posts around the homestead.

(Skin ♀ Spilsby, Nat. Mus., Melb.)

42. *XOSTEROPS LATERALIS* (Latham).—Grey-backed Silvereye.

Sylvia lateralis Latham, Ind. Orn. Suppl., 1801, p. 55.

By far the most abundant birds on all the islands. Seen everywhere in little parties hunting among the bush. The early morning song is a rather elaborate affair, and differs entirely from the twittering notes uttered by the birds as they pass from bush to bush feeding during the day time. Nests containing young and eggs in all stages of incubation were numerous, and nest-building and laying were going on actively throughout the whole of December.

(Skins ♂ ♂ ♀ Reevesby, Nat. Mus. Melb. ♂ ♂ ♂ ♀ S.A. Mus.)

43. *ANTHUS AUSTRALIS AUSTRALIS* Vieillot.—Pipit.

Anthus australis Vieillot, Nouv. Dict. Hist. Nat., xxvi., 1818, p. 501.

Present in small numbers on most islands. Particularly abundant on Marum, Partney, and Hareby.

(Skins ♂ ♀ Reevesby, ♂ Winceby, Nat. Mus., Melb. ♂ ♂ S.A. Mus.)

Introduced Species.

44. *STURNUS VULGARIS* Linnaeus.—Starling.

Sturnus vulgaris Linnaeus, Syst. Nat., 1758, p. 167.

45. *PASSER DOMESTICUS* (Linnaeus).—House Sparrow.

Fringilla domestica Linnaeus, Syst. Nat., 1758, p. 183.

Sparrows and starlings are naturally most abundant on Reevesby and Spilsby, where homesteads are situated and farming is carried on; but sparrows were breeding freely in the boxthorn bushes on Lushy.